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CONTENTS.

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

HUNTERIAN LECTURE on the Relation of Disease of the Gall-Bladder to the Secretory Function of the Stomach and Pancreas. By Prof. H. ERNEST GRIFFITHS, M.S., F.R.C.S. 265

AN ADDRESS on Progress and Problems in Epidemiology. By RICHARD J. REECE, C.B., M.D., M.R.C.P., D.P.H..... 271

ORIGINAL ARTICLES.

Pernicious Anæmia: An Analysis of 117 Cases. By P. N. PANTON, M.B., B.Ch., A. G. MAITLAND-JONES, M.D., M.R.C.P., and GEORGE RIDDOCH, M.D., M.R.C.P..... 274

Intrathoracic Catastrophes Simulating the Acute Abdomen. By J. HOGARTH PRINGLE, F.R.C.S. 279

The Treatment of Kala-Azar by "Stibenyl": A Report on Ten Cases. By L. E. NAPIER, M.R.C.S. 280

Deposit Contributors to National Health Insurance: Drawbacks of the System. By HAROLD S. BEADLES, M.R.C.S..... 311

CLINICAL AND LABORATORY NOTES.

A Note on a Case of Enuresis Treated by Electricity. By MARY O'BRIEN BEADON, M.B., B.S. 283

Herpes and Varicella. By JOHN F. MCCLEAN, M.R.C.S. 283

A Case of "Subpleural" Lipoma in a Child. By C. F. BEYERS, M.B., B.S., F.R.C.S. 283

Acute Osteomyelitis Treated by Early Incision; Recovery. By P. B. KITTEL, B.Ch., M.R.C.S. 284

MEDICAL SOCIETIES

Royal Society of Medicine: Section of Anæsthetics: Cardio-Vascular Conditions in Relation to Anæsthesia 284

Royal Medico-Chirurgical Society of Glasgow..... 286

Cardiff Medical Society: Influence of Intestinal Bacteria upon the Thyroid Gland 286

REVIEWS AND NOTICES OF BOOKS.

An Introduction to the Practice of Preventive Medicine. By Prof. J. G. Fitzgerald, M.D. Assisted by P. Gillespie, M.Sc., and H. M. Lancaster, B.Sc..... 287

Der Künstliche Pneumothorax. By Ludwig von Muralt 288

Introductory Lectures on Psycho-analysis. By Prof. Sigm. Freud, M.D., LL.D., English translation by Joan Riviere... 288

Remembering and Forgetting. By Prof. T. H. Pear, M.A., B.Sc..... 289

Mistakes and Accidents of Surgery. By Harold Burrows, C.B.E., M.B., B.S., F.R.C.S. 289

Bronchoscopy and Esophagoscopy. A Manual of Peroral Endoscopy and Laryngeal Surgery. By Prof. Chevalier Jackson, M.D., F.A.C.S. 289

Le Curettage Utérin. By Prof. J. Fiolle..... 290

Differentialdiagnose. By Prof. Dr. Richard C. Cabot 290

Pelvic Neoplasms. By Prof. Frank Worthington Lynch, A.B., M.D., and Alice F. Maxwell, B.S., M.D. 290

NEW INVENTIONS.

Elevator for the First Rib (Mr. W. H. C. Romanis). —(*Illustrated*) 290

LEADING ARTICLES.

THE HEALTH INSURANCE CONFERENCE 291

UNDIAGNOSED ABDOMINAL EMERGENCIES 291

THE BACTERIUM PNEUMOSINTES 292

ANNOTATIONS.

The Constancy of the Germ-Plasm 293

Bilharziasis in Europe .. 294

The List of the Royal College of Physicians of London 294

The Results of Tonsillectomy..... 294

Chemical Constitution and Bactericidal Action 295

Royal Society of Medicine: The Position of Associates 295

Treatment of Rectal Prolapse in Children 295

The Fees of Medical Witnesses..... 296

Technique in Grading Milk 296

The Internationalisation of Public Health Work.... 297

The Study of Animal Diseases 297

Sugar, Alkalies, and Anæsthesia 298

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VI.—The Treatment of Abdominal Injuries. By Prof. CHARLES A. MORTON, F.R.C.S. 298

SPECIAL ARTICLES.

The Following-up of Cases of Venereal Disease.... 299

Honour to the Stretcher-Bearer: "Dans les Boues de la Somme."—(*Illustrated*) 300

PUBLIC HEALTH SERVICES.

Some Points from the Guildhall Conference on Health Insurance.—Public Health in Local Acts 301

CORRESPONDENCE.

The British Red Cross in Greece (Sir A. Stanley).. 302

Gastric Ulcer and Gastric Cancer (Dr. Alfred C. Jordan) 302

The Treatment of Gastric and Duodenal Ulcer (Dr. Norman Kletz) 303

Education in Cancer Problems (Prof. Wm. H. Woglom) 304

The Inter-Relations of Tuberculosis and Rickets (Dr. V. F. Soothill)..... 304

"Censure at an Inquest" (Dr. H. A. Burridge)... 304

The Diagnosis of Small-Pox (Dr. R. H. Kennan).... 305

The Diploma in Public Health (Dr. John C. McVail) 305

The R.M.B.F. Guild (Lady (Rose) Bradford, Mrs. Scharlieb, M.D., Lady Fripp)..... 305

The Dentists Register (Mr. Norman C. King)..... 306

Cœliac Disease (Dr. Reginald Miller)..... 306

"Lunacy Reform": A Lecture to Tongue-Tied Guests 306

OBITUARY.

Prof. James Ritchie, M.D., B.Sc., F.R.C.P..... 307

Alexander Lewers, M.R.C.S., D.P.H. 307

MEDICAL NEWS.

University of Oxford..... 308

Roy. Coll. Phys. Lond.... 308

Roy. Coll. Phys. Edin., Roy. Coll. Surg. Edin., and Roy. Fac. Phys. and Surg. of Glasg..... 308

West Kent Medico-Chirurgical Society 308

Royal Institution 308

Rontgen Society 308

Two Million Shillings Fund for Manchester Hospitals 308

The late Dr. W. E. S. Scott 308

National Hospital for Diseases of the Heart: Post-graduate Instruction 308

Ophthalmological Society of the United Kingdom 308

British Industries Fair.... 309

Small-pox 309

Royal Institute of Public Health 309

The late Dr. G. A. W. Spear 309

Donations and Bequests.. 309

Norfolk and Norwich Hospital 309

THE SERVICES.

Royal Army Medical Corps: Commissions.—Royal Air Force—Indian Medical Service.—Deaths in the Services..... 309

NOTES, COMMENTS, AND ABSTRACTS.

The Opening of the Maudsley Hospital 313

Burdett's Hospitals and Charities, 1922–23 313

A Directory of British Chemical Products..... 313

A Useful Map of London.. 313

Selective Action of Coal-Tar Dyes on Micro-Organisms 314

"Round the Fountain".. 314

Medical Diary 310

Appointments 311

Vacancies..... 311

Births, Marriages, Deaths 311

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INTRODUCTION.

DISEASE of the gall-bladder has long been recognised as a cause of digestive disturbance. It will be my endeavour first to trace the anatomical and physiological relations of the gall-bladder to the stomach and pancreas, paying particular attention to the control exercised by the sympathetic filaments derived from the ninth thoracic segment of the cord and the vagus; then to analyse some symptoms and signs of gall-bladder disease, showing how many of them are dependent on disturbance of gastric and pancreatic functions; finally to enumerate a few tests which may be used to determine error in the secretion of the stomach and pancreas.

ANATOMICAL RELATIONSHIP OF GALL-BLADDER.

The close anatomical relationship of the pylorus, the first part of the duodenum, and the head of the pancreas with the gall-bladder need not be emphasised here. There are, however, a few points concerning their peritoneal connexion, nerve-supply, and lymph drainage which must be carefully considered. The fundus of the gall-bladder is surrounded by parietal peritoneum. The body, however, is only covered on its sides and inferior surface, its upper surface being bare and approximated to the right lobe of the liver. Passing from the neck of the gall-bladder downwards to the first part of the duodenum, and sometimes crossing this to reach the transverse colon, is found a crescentic fold of the peritoneum with a free anterior edge. This has been variously called the cysto-colic, hepato-colic, and cysto-duodenal ligament. Addison found it present in 33 per cent. of cases. In 100 consecutive cases which I have examined at operation, in the post-mortem room or dissecting room, the fold was present in 52, absent in 24, and in the remaining 24 there were so many adhesions around the gall-bladder that it was impossible to say whether the fold were originally present or not. The cysto-duodenal fold is a remnant of the anterior part of the ventral mesogastrium. Contraction of this fold, due to inflammatory changes in the gall-bladder, tends to cause constriction of the duodenum and may be one of the factors concerned in the causation of the regurgitation test-meals commonly found in gall-stone cases. Bricon wrote that the cysto-duodenal fold functioned as a safety-valve in gall-stones by contracting during inflammation and approximating the gall-bladder to the anterior surface of the duodenum, so that the stones might ulcerate through the walls of the viscus into the gut and a spontaneous cure result. In one case I have seen complete obstruction to the duodenum by the cysto-colic fold. The case was diagnosed as carcinoma of the pylorus, and the true condition was found at operation.

LYMPHATICS.

The efferent lymphatic vessels of the gall-bladder pass in the main to a lymphatic gland situated at the junction of the cystic duct with the neck of the gall-bladder, and from there downwards in the gastro-hepatic omentum in relation to the common bile-duct; several lymph-nodes which occasionally attain the size of glands interrupt their course. The relationship to the common bile-duct is maintained as that structure passes behind the first part of the duodenum to become embedded in the posterior surface of the head of the pancreas. Here they inosculate freely with the lymph vessels of the pancreas and duodenum, and share with them the retro-pancreatic lymph glands. Although the flow of lymph from the gall-bladder in normal conditions passes directly to the receptaculum chyli via the retro-pancreatic and cœliac groups of lymph glands, in inflammatory conditions, where some of the channels become occluded, this lymph finds its way into the pancreatic plexus and infection is thus communicated directly to the pancreas.

Nerve-supply.

The nerve-supply of the gall-bladder is derived from the hepatic plexus, the filaments being conducted to their destination along the cystic artery and its branches. The hepatic plexus is an offshoot from the cœliac plexus, which is derived from the fifth to the tenth thoracic nerves via the great and small splanchnics and the right vagus. In the small omentum the hepatic plexus is joined by the branches from the left vagus and also from the diaphragmatic ganglion which marks the junction of the diaphragmatic plexus with the right phrenic nerve. Thus, from a purely anatomical study it might be assumed that the gall-bladder received its nerve-supply from the fifth to the tenth thoracic nerves, both vagi, and the right phrenic. The vagi are undoubtedly the motor nerves to the viscus. There is considerable difference of opinion as to whether the liver, gall-bladder, and biliary passages are endowed with sensory nerve filaments. At one time it was almost universally accepted that the right phrenic nerve supplied the liver and the gall-bladder with sensation, but many anatomists now consider that all sensation of the gall-bladder is due to interference with its peritoneal covering. According to K. G. Lennander, the parietal peritoneum is intensely sensitive to pain, but not to pressure, heat and cold, and this sensibility is increased by inflammation. He states that the visceral peritoneum and abdominal organs are entirely devoid of any sense of pain when inflamed, and that all pain arising from disturbances within the abdominal cavity is caused by irritation through the spread of inflammation to the abdominal walls or pressure exerted upon those parts inervated by the cerebro-spinal system, and that those parts supplied by the vagus and sympathetic nerves only have no afferent fibres for the transmission of painful impulses.

In operations performed on the upper abdomen under local anæsthesia stimulation of the gall-bladder does not produce pain, but this in itself is not a proof of the absence of sensory fibres. Kast and Meltzer, of the Rockefeller Institute, showed that cocaine acts centrally as well as peripherally. When an animal is operated upon under local anæsthesia the abdominal viscera appear to be insensitive to painful stimuli. If, however, the abdomen is opened without anæsthetic, stimulation of any organ causes pain which may be abolished by the injection of cocaine into the limb of the animal. Sensation is similarly lost after exposure of the viscera to the atmosphere. This accounts for the well-known surgical phenomenon that a colostomy may be opened without anæsthetic after the initial operation. All surgeons know that a colostomy is not invariably insensitive. Kast and Meltzer summed up their work by stating that "all experiments lead up to the one unmistakable result which can be stated in a few words: the normal gastro-intestinal canal possesses a sensation of pain." In support of the view that the phrenic nerve supplies sensory fibres to the gall-bladder, cases of gall-stones are quoted in which pain was referred along the phrenic nerve to other branches of the cervical plexus supplying the skin in the region of the point of the shoulder and the axilla. In the series of cases which I have examined this referred pain has been a rare symptom, always associated with spread of inflammation to the parietal peritoneum in relation to the diaphragm, thus directly

affecting the twigs of the phrenic nerve which pierce that muscle. Working purely on an anatomical basis, Ramstrom was unable to demonstrate any filaments of the phrenic or intercostal nerves entering the liver.

In inflammatory conditions of the gall-bladder there is frequently an area of hyperæsthesia which follows closely the distribution of the ninth right intercostal nerve. In two cases I have seen an attack of herpes zoster affecting the area of skin supplied by this nerve following an attack of acute cholecystitis. Frequently a zone of hyperæsthesia is found below the angle of the right scapula over an area of skin which is supplied by the posterior branch of the ninth intercostal nerve. To sum up: The vagus is the motor and secretory nerve to the gall-bladder and bile passage, and is inhibitory to the sphincter of the ampulla of Vater. The sympathetic deriving its fibres from the ninth right intercostal segment is the sensory nerve to the gall-bladder; it is inhibitory to the muscular wall, but supplies the motor filaments to Oddi's sphincter. Thus stimulation of the vagus causes emptying of the gall-bladder through a relaxed sphincter, and stimulation of the sympathetic causes closure of the sphincter and filling of the lax-walled gall-bladder with bile. The vagus in the stomach is, again, the motor and secretory nerve and is inhibitory to the pyloric sphincter. The sympathetic derived from the fifth, sixth, seventh, eighth, and ninth thoracic segments is inhibitory to the muscle in general, but motor to the pyloric sphincter. The ninth intercostal segment is mainly responsible for the contraction of the pylorus. The pancreas derives its nerve-supply from both sympathetic and vagus. Stimulation of the vagus causes profuse, thin secretion from the pancreas, whereas stimulation of the sympathetic is followed by a small but thick secretion. My investigations upon the nerve-supply of the pancreas are not yet complete, but so far they seem to point to the fact that the sympathetic filaments are mainly derived from the ninth thoracic segment.

PHYSIOLOGICAL RELATIONSHIPS OF THE GALL-BLADDER.

It is now necessary briefly to review the normal physiological relationship between the stomach, pancreas, and gall-bladder. Appetite and the ingestion of food into the stomach are the signals for the secretion of acid gastric juice; the pyloric canal is firmly closed, and the peristaltic waves of the stomach churn up the food and impel it against the barrier of the pyloric sphincter. As the food gets broken up the stomach contents become more acid, the sphincter relaxes, and a little chyme is squirted into the duodenum, where its acidity causes immediate reflex closure of the pylorus. This process is repeated until the stomach is emptied. While this process is going on secretin is produced, which stimulates the pancreas and liver to the increased production of their digestive ferments. Rhythmical contractions of the gall-bladder also occur, and its store of concentrated bile is added to that produced by the liver. The presence of the alkaline juices in the duodenum rapidly neutralise acid chyme escaping from the stomach, and themselves tend to produce a reflex relaxation of the pyloric sphincter. In the later stages of gastric digestion the movements of the stomach become less violent, and the pressure within is considerably diminished. At the same time the alkalinity of the duodenum rises, with resultant reflex inhibition of the sphincter, and thus a small amount of regurgitation occurs periodically from the duodenum to the stomach.

The liver and the pancreas are both stimulated by the same hormone secretin, and their outflowings pass to the duodenum through a common opening. It is evident, therefore, that there must be a close relationship between the bile and pancreatic juice. Chemical investigations have proved that the digestive activity of pancreatic juice is increased twofold by an adequate quantity of bile. One phase of my work has been to study the effect on digestion of the elimination of the gall-bladder by disease. In all diseased conditions of the gall-bladder its function as a reservoir of bile is temporarily or permanently abolished. The majority of cases which I have studied have been inflammatory, generally complicated by the presence of gall-stones. It has long been known that in such cases the little muscular tissue of the gall-bladder is gradually replaced by fibrous tissue, and its elasticity is lost. On this pathological fact Courvoisier based the interpretation of his law. Studying these cases from the physiological point of view, and for the moment ignoring the pathological aspect, a condition is produced equal to extirpation of the gall-bladder from the biliary circulation. Considering this from a purely theoretical point of view, it would be expected that the bile from the liver would pass in a steady stream into the duodenum with no reserve collection for use when most needed for digestion. The bile entering the duodenum when the stomach is at rest would produce a relative increased alkalinity on the distal side of the pylorus resulting in inhibition of the sphincter and consequent regurgitation into the stomach. Small doses of alkali injected into the stomach would stimulate the secretion and produce a condition of hyper-acidity, which, however, would tend to be neutralised by the alkaline causative agent. The effect of this constant stimulation of the stomach with neutralisation of its contents produces a condition of atonia of the walls of the viscus, but also hypertrophy of the pyloric sphincter from its constant exercise. In the normal process of digestion bile does not start to flow freely into the duodenum until the acid chyme has entered. Where bile is passing constantly into the duodenum in the early stages of digestion, however, it still tends to regurgitate into the stomach, neutralising the gastric juice and interfering with the process of gastric digestion.

So much bile having been wasted between meals, there is an insufficient store forthcoming for the process of digestion. This defect makes itself most felt in its effect on the pancreatic juice, the activity of whose ferments is very much diminished by the absence of bile. The fat-splitting ferments in particular are affected, and it would, therefore, be expected that in patients suffering from this condition there would be inability to digest fatty foods. The effect is also marked on the protein-splitting ferments, and the incomplete digestion of protein leads to increase in intestinal decomposition and toxæmia, with resulting indicanurea. It must be remembered that nature generally attempts to make some compensation for loss sustained to the body. When the normal gall-bladder is removed, the common bile-duct endeavours to take its place as a reservoir by dilation. The amount of the bile held in this way is inconsiderable, unless there is some pathological obstruction to its outflow, and its composition remains the same as when it was secreted by the liver.

INFLAMMATION.

Inflammatory lesions of the gall-bladder may produce disturbances in the neighbouring organs in four ways: (1) By destroying its physiological function, as already described; (2) by reflex action; (3) by direct spread of infection; (4) by toxic effect. Inflammation of the gall-bladder is, in the majority of cases, produced by infection with the *Bacillus coli communis*. In a few cases other organisms of the coliform group are found, and more rarely streptococci. It is beyond the scope of this lecture to discuss in detail the route by which the gall-bladder becomes infected; in my opinion, however, it is generally infected by organisms in process of elimination from the portal system by the liver.

Infection may be carried from the gall-bladder to the pancreas by four routes: (1) By the common bile-duct to the ampulla of Vater, then by regurgitation along the main pancreatic duct; (2) by the lymphatic stream already described; (3) by the blood-stream; (4) by direct infection in those cases where the gall-bladder becomes adherent to the duodenum

and lies in close proximity to the head of the pancreas. The two latter routes are of great rarity and will not now be discussed.

Bile in the common bile-duct normally flows at a pressure equal to that of the juice in the pancreatic duct, about 40 mm. of water, so that there is no tendency for regurgitation of bile from the ampulla of Vater along the pancreatic duct. If the pressure tends to rise in the common bile-duct, the gall-bladder, dilating, acts as a safety-valve and reduces the tension. When, however, the gall-bladder contracts in the process of digestion, there is inhibition of Oddi's sphincter, and a free flow of bile into the duodenum results. In certain conditions obstruction to the outflow of bile occurs at the duodenal orifice of the common bile-duct. In these cases there is a tendency for regurgitation of bile towards the pancreas. One cause of obstruction is a gall-stone impacted in the ampulla of Vater. In many cases the impacted stone not only prevents bile in any quantity in passing into the duodenum, but is so situated as to prevent its entrance into the pancreatic duct.

Another common cause of obstruction is carcinoma of the head of the pancreas, which involves not only the terminal part of the common bile-duct but also the pancreatic duct.

Sclerosing pancreatitis also has the effect of inhibiting the flow of bile into the duodenum, but it nearly always does so by pressure on the common bile-duct proximal to the ampulla; at this stage of the disease, therefore, regurgitation of bile is unlikely to take place, although its previous occurrence may have been one of the causes of the sclerosing pancreatitis.

Finally we must consider Oddi's sphincter itself. The occurrence of spasm of this muscle may cause a transient flow of bile into the pancreas in cases where the gall-bladder is already diseased, and cannot act as a safety-valve. The bile may penetrate only a short way along the pancreatic duct and then, with the relaxation of Oddi's sphincter, be washed back into the duodenum by the pancreatic juice; but its stay in the pancreas has been long enough to occasion infection without producing such serious changes as would have occurred had the obstruction in the ampulla of Vater been permanent.

Catarrhal jaundice should be mentioned here as a possible cause of regurgitation of bile, but in the majority of cases the swelling of the mucous membrane of the bile-duct extends above the ampulla of Vater and causes obstruction at a higher level.

Changes in the Pancreas due to Infection from the Gall-Bladder.

Such changes are:—

(1) Catarrhal pancreatitis due to direct inoculation of the mucous membrane of the pancreatic duct with infected bile, generally occurring as the result of a spasm of Oddi's sphincter. The temporary arrest of the secretion of pancreatic juice into the intestinal tract produces considerable disturbance in the process of digestion, particularly of fats, and results in one of those well-known attacks of diarrhœa which are occasional features in some cases of gall-stones. Vomiting may be a serious symptom in these cases, and is proportionate to the degree of infection of the pancreas.

(2) Chronic parenchymatous pancreatitis, which can be detected macroscopically or microscopically in all cases of long-standing infection of the gall-bladder. It is due to infection by organisms carried from the gall-bladder to the pancreas in the lymphatic stream. In the majority of cases it produces few gross symptoms, because the islands of Langerhans are only slightly involved, and because the alveoli of the major part of the body and the tail of the gland generally escape. In a few cases, however, sclerosis of the head of the pancreas is sufficient to cause obstruction to the pancreatic and common bile-ducts. The condition may then easily be mistaken for carcinoma of the head of the pancreas. In the larger group of cases careful pathological examination will generally reveal evidence of disturbance of both the internal and external secretions of the pancreas. This subject will be referred to later.

(3) Acute pancreatitis of the hæmorrhagic, suppurative, and gangrenous varieties is, in my opinion, almost always due to infection from the gall-bladder. It may be impossible to determine the route of infection at operation or autopsy, owing to the extensive destruction of pancreatic tissue. In some cases there is very definite evidence of regurgitation, in other cases there is none, and it must be presumed that the infection spreads via the lymphatics.

The Common Bile-Duct and the Sphincter of the Ampulla of Vater.

I should like to consider for a few moments the changes that may occur in the common bile-duct and the sphincter of the ampulla of Vater (Oddi's) in so far as they are concerned with the condition already described. I have already referred to catarrhal changes in the mucous membrane, and shall now deal only with the fibrous and muscular coats. The passage of irritant fluid, such as infected bile, always tends to produce increased muscular activity in an endeavour to expel it. The walls of the common bile-duct contain very little muscular tissue, but what is there contracts in peristaltic waves and, at the same time, reflexly, causes inhibition of Oddi's sphincter. At times it appears that the peristaltic action loses its rhythm, and the most marked result is a temporary spasm of the ampulla of Vater. The muscle in this region is so much greater than that in the common bile-duct that where the latter is diseased it becomes a law unto itself, and if for any reason there occurs contraction of the sphincter, independent of the muscle impulses passing down the bile-passages, the spasm produced is sufficiently strong to ignore the natural stimuli. It is found that spasm of the sphincter of the pylorus is associated with spasm of Oddi's muscle, and if a relationship can be found between pyloric spasm and disease of the gall-bladder, another very definite reason may be deduced for the temporary obstruction to the flow of bile into the duodenum and its temporary regurgitation along the pancreatic duct. The infected bile entering the duodenum sets up a mild duodenitis which in itself is one of the most frequent sources of pyloro-spasm.

THE REFLEX NERVOUS ARC.

Irritation of the mucous membrane of the gall-bladder causes a reflex irritability of the vagus which is most marked by its action in the stomach, where an increase in the amount and acidity of the gastric juice is produced, associated with relaxation of the pylorus and regurgitation from the duodenum. Whereas in the majority of cases the vagus reflex is the more marked, in others the sympathetic reflex is more evident. In this type of case the inflammation is generally less chronic. As would be expected, it is shown by increased action of that portion of the sympathetic derived from the ninth thoracic nerve. There is spasm of the ampulla of Vater and relaxation of the gall-bladder walls with consequent dilation of the viscus; in the stomach there is spasm of the pylorus, but as the ninth thoracic segment supplies only the pylorus there is no sympathetic effect on the remainder of the stomach, and the vagus reflex remains unchecked, causing hyperchlorhydria and contraction of the organ. The first and second parts of the duodenum are dilated and the pancreatic secretion is concentrated but small. This condition is clinically known as pyloro-spasm, and although in the majority of cases the irritating focus is in the gall-bladder it may occur anywhere in that portion of the digestive tract where the terminal filaments of the sympathetic derived from the ninth thoracic segment are found—namely, gall-bladder, bile-ducts, pylorus, the first and second parts of the duodenum, and the pancreas.

I wish now to dwell for some time on the evidence of gastric and pancreatic disturbance which may be deduced from the history and clinical examination

of patients suffering from gall-bladder disease. Here I shall take as a type cases of cholelithiasis associated with cholecystitis. From the patient's point of view, the most important symptom of the gall-stones is pain, which may be of three types: (1) biliary colic, (2) biliary ache, and (3) biliary dyspepsia.

Biliary Colic.—This is an agonising pain, starting in the right side of the abdomen. Usually, when it can be accurately located, at a point one-third of the way from the tip of the ninth right costal cartilage to the umbilicus, but the point of maximum intensity of the pain varies slightly in position, and may be found immediately below the xyphoid cartilage or deep behind the eighth or ninth right costal cartilage. The pain is seldom limited to this one spot; it is generally described as shooting through the "right shoulder." On careful questioning of the patient, the right shoulder is found to refer to the right inferior scapular region. Instead of passing to this region by the direct route, the pain is often stated to shoot round the chest on the right side, following the course of the ninth intercostal nerve. Less commonly pain is referred to the inferior angle of the left scapula; in these cases it appears to shoot through the thorax and never round the left side. Again, the pain may be felt behind the inferior angles of both scapulæ. The pain frequently radiates down the abdomen as far as the umbilicus and sometimes into the right loin. The distribution of referred pain on which most stress has been laid by the majority of authors is one radiating upwards from the right hypochondrium to the point of the shoulder and the axilla on the right side. When present this symptom is pathognomonic of a severe inflammatory lesion of the hepatic, biliary, or right diaphragmatic regions. This pain never occurs in gall-stone colic uncomplicated by acute or subacute cholecystitis. The onset of the colic is sudden, and its intensity rapidly increases to reach a maximum in a few minutes. The attack may last for half an hour or be prolonged for several hours, with short respites from the more severe pain. The colic ceases as abruptly as it commenced, but is always followed by a feeling of soreness underneath the right costal margin and in the region immediately below it. Usually the pain starts half an hour or more after a full meal, sometimes when the patient is in bed, and sometimes after he has been shaken by riding or motoring. Although in this lecture I do not propose to deal with the effect of stomach and pancreatic functions on the disease of the gall-bladder, it may be noted again that the digestion of food in the stomach and duodenum, through the production of secretin, stimulates the muscle of the gall-bladder, and the normal inhibition and contraction of the pyloric sphincter reflexly find their counterpart in the movements of the sphincter of the ampulla of Vater and the neck of the gall-bladder. In this way it will seem that the passage of a stone from the gall-bladder towards the duodenum is more likely to occur within the first two hours after a meal than at any other time. In long-standing cases, where the muscle of the gall-bladder has been replaced by fibrous tissue, there is no response to the stimuli of the stomach, and biliary colic becomes a rare symptom.

Biliary Ache.—Gall-stone pain is frequently of a dull, aching character, interspersed with periods of acute exacerbation. It is referred to the right subcostal region and the right lumbar region, the pain appearing to travel through the abdomen between these two areas. A constant and steady pain in the right lumbar region, which may extend to the left side of the spine, is often present. It seldom becomes acute, and is not, therefore, usually a primary source of complaint on the part of the patient, but a leading question will nearly always establish its presence. It generally becomes most evident as the more severe anterior abdominal pain is subsiding. The onset of biliary colic has been already described as dramatically sudden; the pain now under review has a more insidious beginning. There is a vague feeling of abdominal discomfort, gradually increasing until pain becomes definite and localised. The severity of the pain varies considerably; it may cause little inconvenience, or the patient may be prostrated. In this acute condition the pain differs from biliary colic in several essentials; it is not of a griping nature, but is rather burning and stabbing, whilst referred pain along the superficial cervical plexus is the rule rather than the exception. The pain is sustained, and when remission occurs it is gradual. Shivering almost invariably heralds an attack, and always occurs before the rise of temperature. Constitutional disturbance is marked in severe cases, the temperature rising to 103° F. or higher, and the pulse-rate increases to 120–140. Furred tongue, constipation, scanty urine, and vomiting testify to the degree of toxæmia. It is evident that biliary ache is due to infection of part or all of the extra hepatic biliary apparatus, and that the pain is the result of inflammation. It may be caused by irritation of the nerve endings of the mucous membrane by producing a catarrhal condition of the bile-ducts resulting in increased resistance to the flow of bile and consequent increased tension in the liver and gall-bladder. The referred pain to the neck and acromial region only occurs when the inflammatory changes have spread to the serous coverings of the gall-bladder and the peritoneum on the under surface of the diaphragm, thus involving terminal sensory filaments from the right phrenic nerve. The ache in the lumbar region is due to the spread of infection to the head of the pancreas, resulting in congestion of that organ. It might be expected that there should be some anterior pain felt just above the umbilicus to demonstrate the involvement of the pancreas, but clinically it is impossible to differentiate between this pain and that due to the involvement of the bile passages and the neighbouring peritoneum.

Biliary Dyspepsia.—The third type of pain, usually described by the patient as "indigestion," appears to have a definite relation to meals. There is a feeling of weight and fullness in the epigastrium, accompanied often by a dull aching in the left scapular region. Flatulence is constantly associated with these symptoms, and belching or vomiting gives considerable relief. This condition is usually most acute about half an hour after taking food, and lasts about two hours. Almost every patient who has biliary dyspepsia discovers, sooner or later, that the old household remedy of a glass of hot water will give relief. It has been claimed that the drinking of a glass of hot water before meals is a panacea for all digestive ills. It may now be stated, with a greater degree of certainty, that the drinking of a glass of hot water after meals in women is diagnostic of one of the most severe of digestive ills—gall-stones.

VOMITING.

Vomiting is one of the commonest symptoms of gall-stones, and occurs in 81 per cent. of my cases. It occurs in a variety of different forms; in biliary colic with impaction of the stone, generally in the cystic duct, the patient experiences an extreme degree of nausea associated with a feeling of goose-flesh, which is rapidly succeeded by cold, clammy sweating and severe vomiting. The patient is quite prostrated, and, according to Moynihan, with the general loss of muscular tone the stone, which is at the mouth of the cystic duct, falls back into the gall-bladder, and relief of symptoms is obtained. He describes one case in which on two occasions he was able to detect the gradual enlargement of the gall-bladder accompanying two severe attacks of biliary colic with nausea and vomiting. In this patient the obstruction of the cystic duct was due to kinking and not to a stone. I have met two such cases; in one the obstruction was due to a solitary gall-stone, and in the other to a shrapnel ball. The latter was a case of a young officer who was wounded in the right side of the chest, the missile passing through the pleural cavity, the diaphragm, the right lobe of the liver, and penetrating into the gall-bladder. X ray localisation suggested that the position of the foreign body was in the right lobe of the liver, but succeeding attacks of biliary colic,

accompanied by deadly nausea and vomiting, with coincident enlargement of the gall-bladder, succeeded by prostration with abatement of the symptoms, indicated the presence of the foreign body in the gall-bladder. The diagnosis was confirmed at operation, the shrapnel ball was removed, and as there was no evidence of inflammatory change in the walls of the gall-bladder it was closed. The patient made an uninterrupted recovery.

The vomiting associated with biliary colic is in the main reflex. In the first stage contraction of the walls of the gall-bladder is associated with regurgitation of duodenal contents through the pylorus, and the patient experiences nausea, rapidly succeeded by a reflex spasm of the pylorus in response to the spasm of the sphincter of the neck of the gall-bladder or the ampulla of Vater; peristaltic waves of the stomach wall increase and violent vomiting results.

Biliary dyspepsia is accompanied by vomiting of a different kind, occurring after a full meal, and not, as a rule, accompanied by much nausea. It is generally small in quantity and of a watery regurgitant type. Occasionally it is copious, resulting in complete evacuation of the stomach, and affording the patient complete relief from pain without producing that degree of prostration which is a feature of vomiting associated with biliary colic. Vomiting in these cases is due to direct irritation of the mucous membrane, the stomach having been rendered hypersensitive by inflammatory changes consequent upon the regurgitation of duodenal contents and the increased acidity of gastric juice.

A third type of vomiting occurs in patients who have been jaundiced. Nausea is again a distinctive feature, but the amount of material expelled from the stomach is often small. This vomiting may occur after every meal or, as is more frequent, attacks of short duration occur at regular intervals coincident with the rise and fall of the pigmentary curve. Two factors operate in producing this condition: first, the gastric irritability already described in biliary dyspepsia, and secondly, the toxic effect of the circulating bile on the vomiting centre in the medulla, shown by the increase in vomiting found with the increase in jaundice. A fourth type of vomiting which occurs in gall-stone patients is periodic. It does not appear to be associated with any gross disturbance of the gall-bladder or bile passages, although it may follow an attack of cholecystitis. It is not associated with that degree of nausea found in the first and third types, but is always accompanied by mild diarrhœa, the stools being fatty and undigested, resembling somewhat those found in cœliac disease. The attack generally lasts for several days, in more severe cases extending into weeks. Wasting is a very marked feature in cases of long duration. The character of the stool, with the marked increase in undigested fat, is symptomatic of pancreatic insufficiency. Other evidence of pancreatic insufficiency, such as increased diastase content of the urine, indicanurea, positive Loewe's mydriasis test, and sometimes transient glycosuria, all tend to add weight to the diagnosis. It may safely be assumed that this type of vomiting is due to a type of pancreatitis which involves both the internal and external secretion. I have not had the opportunity of making a post mortem on such a case, but hazard the opinion that the condition is due to catarrhal pancreatitis, the result of periodic invasion of the gland by micro-organisms derived from the gall-bladder.

The next class of case with which I propose to deal is that arising from ulceration of gall-stones through the wall of the gall-bladder into the alimentary tract and causing intestinal obstruction. It is difficult to speak of the vomiting in this condition as a definite fifth type, because as the disease progresses the causes and character of the vomiting alter. In the typical case the gall-bladder becomes adherent to the duodenum. At the commencement of the ulcerative process severe nausea and vomiting set in, similar to those experienced with the impaction of a gall-stone in the cystic duct. As the stone emerges into the duodenum the vomiting becomes more persistent and regurgitant in character, and may be found to contain a small amount of blood. When the stone has left the gall-bladder and commenced its journey down the small intestine, there is a temporary abatement of symptoms until the stone becomes impacted in some part of the bowel. As a rule impaction occurs for a short interval at several points before the calculus is brought finally to rest about 18 inches proximal to the ileo-cæcal valve. During the temporary stoppages there is considerable intestinal colic, which may be accompanied by reflex vomiting without nausea. When finally the intestinal obstruction has become established, vomiting once more becomes persistent, at first consisting of unaltered stomach and duodenal contents, but later becoming fæculent. In rare cases where obstruction occurs after ulceration of the stone into the transverse colon, the initial vomiting is less severe and no blood is found in the vomit. On the other hand, streaks of bright blood may be found in contents of the lower bowel evacuated before the obstruction occurs.

Jaundice.—Jaundice, although one of the classical symptoms of gall-stones, only occurs in about 17 per cent. of all cases. The percentage of hospital cases who suffer from jaundice is much greater because, as a general rule, only those come up for treatment who have suffered from biliary colic, which itself occurs in only a minority of cases. Jaundice, associated with disease of the gall-bladder, is essentially of the obstructive type. Clinically, it may be intermittent, remittent, or progressive. The onset of intermittent jaundice is generally preceded by an attack of biliary colic a few hours before. In a typical case the patient complained that she had an attack of pain in the evening and the next morning her friends noticed her eyes were yellow. Early jaundice is difficult to recognise in artificial light, which probably accounts for the fact that the condition is nearly always first recognised in the morning. This type of jaundice lasts for only two or three days, and may cause the patient little inconvenience; in the majority of cases it is due to the temporary arrest of a gall-stone in the common bile-duct, and subsequent inflammation and swelling of the mucous membrane. The degree of infection is reflected by the rise in the evening temperature to 101° F., which nearly always accompanies the case of transient jaundice. In the remittent type of jaundice the onset is similar to the one already described, but may persist for weeks and even months, and is never of the same intensity during the whole of that period. As a rule the degree of jaundice varies fairly regularly every three to five days, getting gradually deeper and lighter but never disappearing. A simple test for determining slight variations in the degree of jaundice may be made by collecting a little blood in a capillary tube, allowing it to stand, and comparing the pigmented serum with that taken at some other time. The jaundice in this type of case is due to a stone in the ampulla of Vater, causing incomplete obstruction. The morning and evening variation is due to the greater amount of bile secreted by the liver during the day.

The onset of progressive jaundice is insidious, and seldom associated with biliary colic as in the two previous types. The degree of pigmentation increases from day to day, and although in the early stages of the disease, before obstruction to the outflow of bile is complete, there may be slight variation between morning and evening, this soon disappears. The temperature generally remains normal, the obstruction may be due to the stone in the cystic duct causing lateral pressure on the common bile-duct, adhesions, or, more commonly, changes in the pancreas. Sclerosing pancreatitis, already described, causes increased pressure on the buried portion of the common bile-duct. Other evidence of the disease of the pancreas is forthcoming in periodic attacks of vomiting, with marked wasting and the undigested fatty stools to which I have already alluded. I have not endeavoured to describe all the methods by which jaundice may occur in cases of disease of the gall-bladder, but

only to emphasise the type in which it is definitely associated with the kind of pancreatic complication which is dependent upon cholecystitis.

CLINICAL EXAMINATION OF THE PATIENT.

On inspection of the abdomen it is unusual to observe anything, apart from occasional jaundice, indicative of gall-bladder disease or associated disturbance of its neighbouring organs. In the majority of cases the patient is well covered; rarely, a visible fullness to the left of the mid-line may indicate distension of the stomach. Rapid loss of weight, with attacks of diarrhœa and vomiting, is shown by the looseness of the skin. When in such cases the skin is dry and parchment-like, or even scaly, further examination always reveals definite pancreatic involvement.

Findings on Palpation.—In acute, and often in subacute, cholecystitis definite areas of superficial hyperæsthesia can be made out. This hyperæsthesia most commonly follows the course of the ninth intercostal nerve on the right side; it is also found in the distribution of the branches of the right cervical plexus. On two occasions I have observed superficial hyperæsthesia over the seventh and eighth intercostal nerves on the left side. In each the symptoms appeared after the acute stage of cholecystitis had subsided and gastric disturbance had become a prominent feature. On deep palpation the most constant sign of gall-bladder disease is tenderness below the tip of the ninth right costal cartilage. In chronic cases which are associated with biliary dyspepsia there is generally tenderness below the ensiform cartilage, which is more or less constant in all inflammatory lesions of the stomach. Sometimes after an attack of cholecystitis, when the gall-bladder tenderness is no longer diffused over the upper abdomen but is limited to Murphy's sign, pain may be elicited by pressure above the umbilicus. When present, this points to subacute inflammation of the proximal portion of the head of the pancreas. Boas first described an area of tenderness on deep pressure extending for 3½ inches to the right of the spinal column on the level of the eleventh thoracic to the first lumbar spines. His explanation was that the tenderness was in relation to the posterior surface of the liver. The cases that I have examined in which there is tenderness in the loin fall definitely into two classes—those where a point of maximum tenderness is situated over the eleventh rib, about 3 inches from the mid-line, and those where the tenderness is situated lower down to the right, and often extending to the left of the second lumbar vertebra. The tenderness over the eleventh rib has been found in all cases of cholecystitis that I have examined; I believe it to be due to the spread of inflammation first to the parietal peritoneum, and then, via the extra-peritoneal lymphatics, to this point, which is the most dependent when the patient is lying down. The lower area of tenderness occurs in its maximum intensity in cases of acute pancreatitis. It occurs only in a minority of cases of gall-bladder disease, but is always associated with other definite signs of pancreatic disturbance. In my opinion it is due to an inflammatory lesion of the pancreas.

Other areas of deep tenderness to which attention has been drawn by various authors are over the spines of the fifth, sixth, seventh, and eighth thoracic vertebræ, and over the inferior angle of the left scapula. Tenderness in these regions is by no means as marked as that which occurs over the eleventh right rib, and is present in the more severe forms of biliary dyspepsia and is most marked after an attack of vomiting. Tenderness in these two places can be found in all cases of gastric ulcer, which occur proximal to the pylorus. It seems, therefore that it is due to an inflammatory lesion of the stomach. Finally, deep tenderness may be found over the distribution of the right superficial cervical plexus.

On percussion and auscultation valuable information may be obtained of gastric disturbance. In all cases of biliary dyspepsia, and practically all cases of gall-stones, the stomach is found to be enlarged.

X Ray Findings.—X ray examination of the stomach, after introduction of a barium meal, shows dilation of the stomach and evidence of pylorospasm. When examined on the screen regurgitation through the pylorus is seen to be much more marked, and to occur much earlier than in the case in normal digestion.

CHEMICAL PATHOLOGY.

The clinical evidence already deduced of stomach and pancreatic disturbance lead to deductions which would have to be regarded as theoretical unless chemical pathology demonstrated their truth. In this branch of the research I have worked with Dr. Mackenzie Wallis, who has conducted all the laboratory investigations and with whom I hope shortly to publish a complete account of our work.

Test-Meal.—The examination of a large number of simple test-meals extracted after one hour's digestion in the stomach has shown that in over 90 per cent. of all cases of gall-stones there is definite hyperchlorhydria associated with regurgitation. In only two cases have we found true hypochlorhydria. Occasionally it was found that there was definite hyperchlorhydria without any evidence of regurgitation. In these cases there was clinical evidence of pylorospasm. We have not found the fractional test-meal of value in the investigation of gall-bladder disease, owing to the difficulty in determining the amount of regurgitation.

Tests of Pancreatic Sufficiency.—The estimation of the amount of diastase in the urine has proved the most delicate test of pancreatic error that we possess. In the normal person the amount of diastase varies between 10 and 30 units, with an average of about 22·5. In our series of cases we have found that in 28 per cent. of cases the diastase has risen to between 50 and 100 units, being always high in cases associated with acute inflammatory lesions of the gall-bladder, and in cases where diarrhœa is a symptom. The amount of diastase in the urine of an individual patient varies from time to time, and is an indication of the varying degree of pancreatic inflammation.

Glycosuria is rare, and has only been found in some of those cases where there has been extensive destruction of the pancreas as a result of sclerosing pancreatitis or acute hæmorrhagic pancreatitis. Indicanuria in varying degree is present in all cases of old-standing gall-bladder disease. It may be stated that bacterial decomposition taking place in the digestive tract and giving rise to the indicanuria is the cause of the diseased gall-bladder. The probability is that a vicious circle is established, and whichever is primary at the onset, in the later stages the interference with pancreatic digestion from the maladmixture of bile predisposes towards intestinal putrefaction, and organisms carried away by the portal stream and eliminated by the liver are a constant source of reinfection to the gall-bladder. Steatorrhœa is found in all cases of obstructive jaundice, and in cases of advanced sclerosing pancreatitis, and in that form of catarrhal pancreatitis whose presence is indicated clinically by diarrhœa. Steatorrhœa is due to lack of pancreatic lipase or its incomplete activation owing to the lack of bile. Loewe's mydriasis test has been positive in only a minority of cases, but in these there has always been other definite evidence of pancreatic insufficiency.

CONCLUSIONS.

I have endeavoured to show that the gall-bladder is only a unit in a definite digestive complex embracing the liver, gall-bladder, pancreas, and stomach, and that any disease affecting one unit is bound to be reflected in the whole system. A careful analysis of the history and clinical examination of a patient suffering from disease of the gall-bladder will reveal many points indicative of involvement of the stomach and the pancreas, but which none the less point to the

original trouble. Infection of the gall-bladder acting reflexly through the vagus nerve tends to cause hyperchlorhydria and regurgitation. In some cases, where the sensory stimulus is greater, pylorospasm is the result of a sympathetic reflex through the ninth thoracic segment. Regurgitation from the duodenum may also be attributed to the unregulated flow of bile in cases where a gall-bladder is no longer capable of acting as a reservoir.

The pancreas is peculiarly prone to infection from the gall-bladder. In the majority of cases infection occurs through the lymphatics, in others by the regurgitation of bile along the main duct consequent upon obstruction at the ampulla of Vater. This obstruction is frequently due to spasm of Oddi's sphincter and occurs with pylorospasm. The secretion of the pancreas into the duodenum is seldom markedly diminished, the exception being in cases of catarrhal pancreatitis, but through lack of adequate admixture of bile the digestive function of the pancreatic juice may be seriously diminished.

The internal secretion of the pancreas, except in very rare cases—e.g., pancreatic necrosis—is not very much upset, although the increased amount of diastase in the urine and occasional positive Loewe's reaction are indications of some slight alteration.

It will be seen that in some obscure cases of gall-bladder disease, where the cause cannot be found by the ordinary clinical methods, exhaustive examination of the functions of the stomach and the pancreas may lead to a correct diagnosis.

An Address

[ABRIDGED]

ON

PROGRESS AND PROBLEMS IN EPIDEMIOLOGY.

The Presidential Address delivered before the Section of Epidemiology and State Medicine of the Royal Society of Medicine on Feb. 2nd, 1923,

BY RICHARD J. REECE, C.B., M.D., M.R.C.P., D.P.H.

MY first duty is to thank the Section of Epidemiology and State Medicine of the Royal Society of Medicine for the very great honour conferred on me by the members in electing me to the important position of President, and my second is to offer my apologies to the section for the delay that has occurred in the delivery of the customary Presidential address. To what extent and with what success this Society has contributed to the science of epidemiology and to medical literature can be realised by reference to the index of the papers that have been read at its meetings and to the reports of its various committees which have been formed from time to time for the purpose of studying special branches of epidemiology, but there is yet much to be learnt and many problems remain to be solved.

While the Society's transactions bear witness to the wide range of subjects considered at its meetings and to the merit of the contributions furnished by its members to the study of epidemiology, they also testify that many of the most important papers have been written by medical officers of the Royal Navy, the Army, and the Colonial services, and by medical men who have not served in any of the State medical services, but without in any way detracting from the value or minimising the high esteem that is due, and deservedly due, to the work of these men, it can be said that the elucidation of epidemiological problems has been closely associated with the public health department of the Civil Service.

THE FOUNDATION OF THE SOCIETY.

The birth of our Society in 1850 took place at a time when John Simon had commenced to write, and the medical staff of the Privy Council came into existence. To this staff belonged Netten Radcliffe, George Buchanan, and others, the value of whose epidemiological work cannot be overrated. When the State Medical Department was transferred to the newly constituted Local Government Board in 1871, other men joined the service, and the study of epidemiology was continued by Power, Thorne-Thorne, Ballard, Barry, Parsons, T. W. Thompson, Theodore Thomson, Bulstrode, and many more whose names are household words in this Society. Only last year one of our members, who joined the Society in 1887, departed from us, my old colleague, Robert Bruce Low, who by his industry, skill, and perseverance materially assisted the advancement of our knowledge in regard to the prevalence and distribution of disease throughout the world.

When our Society was first instituted it advocated adequate endowment for medical research. We cannot claim that such a proposition emanated solely from our Society; it has been advanced by others, but we can congratulate ourselves that with the advent of the Medical Research Council, one of its primary objects has been fulfilled. The science of epidemiology is not limited to one country, it embraces the whole world; it is not confined to one race of man, nor, indeed, to mankind alone, it extends to the animal and vegetable kingdoms. It is closely associated with geography and history, with the work of the physiologist, pathologist, bacteriologist, and chemist, with the science of statistics, and with clinical medicine. Its interests are far-reaching and our Society, founded for its study, can look forward with satisfaction to the progress our branch of medicine is bound to make as a result of the comprehensive work carried out under the auspices of the Medical Research Council.

SIR PATRICK MANSON'S VIEWS ON FUTURE LINES OF RESEARCH.

In his Presidential Address to this Society in November, 1900, Sir Patrick Manson set forth what he thought should be the future lines of research in the elucidation of the many epidemiological problems brought prominently before the world by having to include the protozoa and nematodes among the important pathogenetic organisms affecting man, and by the knowledge that many diseases are spread in a variety of ways by blood-sucking arthropods. He considered that each problem, after thoughtful formulation, should be carefully worked out by a special investigation. He expressed the opinion that this was the only way to advance, as it was the only way to economise the somewhat limited supply of pathological and epidemiological energy in the market, and that as each investigation would probably extend over a considerable period, probably one or two years, in order to secure continuity of work and to minimise risk of interruption by ill-health or other contingencies, it would be better to have two investigators for each subject. During the 22 years that have elapsed since Manson delivered the address there has been considerable stimulus in the study of pathology and bacteriology, sciences that directly improve our knowledge of epidemic disease though not of the epidemicity of disease. Many workers have entered these fields of study, but it cannot be said that there has been any comparable influx of workers in the domains of epidemiology. There are few men who have the time and opportunity to devote to this science, and however rich the reward that may fall to the successful worker from the fact that he has materially assisted in advancing knowledge and in affording relief to suffering humanity, it is nevertheless a sad truism that, judged on the sordid basis of finance, there are other branches of medicine that are more remunerative.

INTERCOMMUNICABLE DISEASES.

Manson's early work on filariasis gave an enormous stimulus to the study to the part that insect life plays in the transmission of disease to man and has resulted in definitely linking up certain diseases with blood-sucking flies; malaria, yellow fever, sleeping sickness, dengue, and the maggot disease of Trinidad and Central and South America are instances of this, and if we turn to diseases that are spread from animals to man, we have an instance of the effect of a legal enactment, within a short period of time from it being put into operation, having the direct result of eliminating a disease from our midst. This is the Rabies (Muzzling of Dogs) Order of the Board of Agriculture and Fisheries which was first put into operation in 1889, and which was in force in one or another part of the country for 15 years. As the result of its enforcement and through the restrictions placed on the introduction of dogs from abroad, hydrophobia ceased to exist in this country, and for a period of 15 years we were free from the disease. Reintroduced during the war period in 1918, the infection speedily disappeared on the re-enactment of the Order, and the Order was withdrawn finally in 1922.

While it is generally accepted that the milk of cows suffering from tuberculous disease of the udder is capable of conveying tuberculosis to man, we see an extraordinary attitude on the part, not only of the medical profession, but also of the veterinary profession to reject any suggestion that the milk of cows can convey other disease conditions to man. An instance of this is the group of symptoms closely allied to those which we are accustomed to associate with the malady known as scarlet fever and which, from the fact that the inculpated cows were at a farm at Hendon, became known as the Hendon cow disease. The reasoned plea advanced that the observed illness in man was the direct outcome of the consumption of the milk of the affected cows was combated with a strenuousness which was remarkable. The opposition to the theory that such a disease in man could be acquired through the consumption of specifically infected milk remains, notwithstanding that the application of the discovery of Horrocks that Malta fever was spread by goats acting through their milk had the immediate effect of eliminating a milk-borne disease which for many years had materially impaired the military efficiency of the British garrison at Malta.

Anthrax is another disease that is communicated directly or indirectly from infected animals to man, but in it the infection is limited to the individual and does not spread from him to the community. For many years it has been known that the infection can be acquired by man through handling specifically infected skins. An instance occurred during the war in which Prof. J. F. Tulloch, of Dundee, then a lieutenant in the Royal Army Medical Corps, found the *Bacillus anthracis* in the cerebro-spinal fluid of a man who was thought to have died of cerebro-spinal fever, and on continuing his investigation he was able to demonstrate that the infection had been acquired through the respiratory tract. By so doing he added another link to the chain of evidence that anthrax is one of the diseases that is air-borne. A more recent instance in connexion with anthrax which is of interest is that of a man who died of anthrax, and who, immediately prior to his fatal illness, had been engaged in unloading bone meal from a vessel in one of the London docks. Colonel P. G. Stock, who investigated the matter, was able to produce evidence that certain samples of the bone meal obtained from the cargo of the vessel were infected with anthrax, and the question at once arises whether the sporadic outbreaks of anthrax that occur among animals in this country are associated with the use of bone meal for manure.

Recent researches have demonstrated the part played by the rat in rat-bite fever, epidemic jaundice, trichinosis, and septic pneumonia, whilst the known fact that the rat-flea is responsible for conveying the infection of plague has in great measure directed preventive measures against the rodent rather than against man, so far as the bubonic and perhaps the septicæmic form of the disease is concerned. As the result of researches into relationship of the flea to the rat, and of the rat to man, plague came to be regarded from the point of view of epidemiology as essentially a rat disease in which human beings may participate. The Advisory Committee for plague investigation in India concluded their interim report of 1910 with the statement that "In districts which suffer annual epidemics of plague, the rat epidemic, on which the human epidemic depends, occurs during some part of that season when the prevalence of fleas is greatest." The seasonal prevalence of plague is therefore dependent on the life-history of the flea.

THE PART OF THE HUMAN "CARRIER" IN INFECTIOUS DISEASE.

When it became known, primarily through the work of bacteriologists, that man as a "carrier" played a part in the spread of infectious disease, a new problem in epidemiology presented itself and inspired fresh efforts to cope with it. Nevertheless a warning was forthcoming from the epidemiologist that the discovery should not be relied on as a final solution of disease causation. The carrier subject was eagerly investigated by the bacteriologist, experimental pathologist, and public health administrator. Enteric fever, paratyphoid, cholera, dysentery, cerebro-spinal fever, poliomyelitis, diphtheria, pneumococcus-pneumonia, influenza, were all subjected to close scrutiny with the object of obtaining effective control over these diseases. It became recognised that there were two types of carriers, the transitory carrier and the chronic carrier, and that the latter may be the subject of periodical recurrences during which he may be peculiarly liable to spread infection. It was thought that he was responsible for the persistence of infection in endemic form and for recrudescence of infection in epidemic or explosive form.

But we are far from understanding the part played by the diphtheria carrier, and while we know that a large number of diphtheria carriers exist it is only occasionally that a carrier transmits the clinical disease to others. The test of virulence of the *B. diphtheriæ* to guinea-pigs is not entirely satisfactory, for although definite strains of *B. diphtheriæ* may prove fatal to guinea-pigs, it does not follow that these virulent strains when harboured by a carrier are those that enable him to transmit clinical diphtheria to other persons.

SEASONAL INCIDENCE OF CERTAIN DISEASES.

We can state without possibility of contradiction that certain diseases have a seasonal incidence. If we take two such diseases with which we are familiar in this country, we can say that in England whooping-cough is prevalent in the first half of the year and scarlet fever in the last half of the year, but we can give no definite reason for this fact. We can say that one is a disease of the spring, and the other of the autumn. Although it has been suggested that the infection of one of these two diseases—viz., scarlet fever—may be conveyed by the domestic flea, most of us believe, rightly or wrongly, that the infection of these diseases is acquired mainly through the naso-pharyngeal tract, and that in the majority of cases it is transmitted from person to person. But even if this is true it adds to the difficulty of explaining why one is a disease of cold weather and the other of warm weather. The explanation will probably be forthcoming when once the cause of the infection is known.

We are still without definite knowledge of the causative micro-organism of small-pox, chicken-pox, scarlet fever, measles, typhus fever, and, perhaps, to this list influenza may be added. We believe that these diseases, with the exception of typhus, are transmitted directly from person to person without the intervention of any insect carrier. At one time,

and until quite recently, we thought that the infection of typhus was communicated in like fashion. Now we know that the infection is transmitted by a biting insect, the louse. Poverty and want and times of famine have been recognised for many years as associated with epidemic prevalence of typhus, and we can appreciate the fact that verminous conditions of persons are allied with such occurrences, and that the verminous condition accounts for instances that have been observed when typhus has been prevalent, and when famine and destitution have been absent. With the knowledge that lousiness must be fairly common among certain classes in Ireland, as evidenced by the fact that some 60 per cent. of Irish emigrants who are now arriving in Liverpool on their way to America and Canada are found to be verminous, we can realise that the absence of widespread prevalence of typhus fever in Ireland must be due to the fact that the causative agent of the disease is lacking.

If we turn to diseases which are definitely associated with a causative micro-organism we can include in the number cerebro-spinal fever, enteric fever, diphtheria, cholera, and plague, and excepting plague each of these diseases is associated with the "carrier" problem. Whether or no there are carriers of cholera who can be classed as "chronic" carriers we have no precise information, but we know that chronic carriers occur in regard to the other three diseases.

In dealing with epidemic and pandemic disease, while it is evident that antecedent or existing causes must have been in operation, we cannot as yet say that we are familiar with them. While we know that certain diseases are prone to a cyclical recurrence we do not yet know what causes are responsible for this recurring cycle of disease prevalence. It is not sufficient explanation to say that epidemics of measles are due to an increase in susceptible material, of children born since the last epidemic, for this would not account for the seasonal prevalence of measles, and still less would it explain the widespread and sudden prevalence of epidemics of influenza throughout the world, during which persons who have passed through a previous attack are again affected.

It may be that certain atmospheric conditions so affect the human constitution as to lessen its power of resistance to disease or that certain low forms of life that we know to be active agents in disease production acquire an additional increase in virulence and power of propagation under differing conditions of the atmosphere not solely referable to changes in temperature. It has been observed on occasions of epidemic prevalence of small-pox that vaccine lymph has appeared to possess undue potency, as shown by the result of vaccination of persons, and that this cannot altogether be explained by a want of due care in the performance of the operation of vaccination which is prone to be associated with panic vaccination. It may be that at such times the susceptibility of the individual to "vaccinia" or to contract small-pox is increased.

"CONTAGIUM VIVUM" AN ESTABLISHED FACT.

The belief in a living cause of disease or contagium vivum is very old. We cannot fail to realise that undoubtedly the greatest progress made in recent years in our knowledge of epidemiology has been the translation of this belief into an established fact; and that this has resulted from the genius of Pasteur in expounding the germ theory of the causation and course of disease, and from the discoveries of Laveran, Manson, and Ronald Ross as to the part played by parasites and insect carriers in disease production. While all this serves to explain endemic forms of disease it does not account for the rapid diffusion and widespread prevalence of disease in epidemic or pandemic form. The essential cause of epidemic diffusion of disease must be dependent on some other factor or factors. There must be something superadded to the disease-producing organisms that augments their virulence or power to affect man; or that increases the susceptibility of the individual or diminishes his power of resistance. The nature of the influence in operation and the necessary part that it plays is unknown.

One cannot fail to be impressed with the persistence of our forefathers that the condition of the atmosphere is in some way responsible for the presence or the absence of disease in epidemic form. At the same time, we must confess that meteorology has hitherto thrown little light on the subject, and notwithstanding the present delicate and far-reaching chemical and physical methods that have been employed in the investigations of the condition of the atmosphere and the magnetic currents of earth and air, these means have entirely failed to show any relation between the physical properties of the air and epidemics of disease.

It is common knowledge that during times of thunderstorms milk readily turns sour. At such times the atmosphere may be charged with moisture, its temperature raised, and so forth. But in like conditions of the atmosphere and in the absence of thunderstorms milk remains unaffected. There appears to be no explanation of this save in the electrical condition of the atmosphere, and if this is the factor that determines the observed phenomenon, knowledge of the manner in which it acts is lacking. Can it be that the acid-producing micro-organisms are stimulated into increased activity through the electrical condition of the atmosphere?

There is another matter which has relation to this subject—namely, the preparation in starch factories of rice starch for laundry purposes. After the starch has been ground into a paste to which water is added, it is further washed with dilute caustic soda to dissolve out more nitrogenous matter (the glutin). At all stages from the rice paste to the final washing the liquid is kept alkaline with caustic soda. It is a well recognised fact that to maintain this alkalinity more caustic soda is required in hot weather than in cold, and further, that in hot weather, when there is thunder in the air, still more caustic soda is required. Under such weather conditions it is not an unusual practice to add formalin to the rice paste to prevent it "turning sour."

The late Dr. R. W. S. Bishop, writing of his experience as a country practitioner at Kirkby Malzeard in the moorland district of Yorkshire, states that "Influenza spreads sometimes so rapidly, especially on the exposed tablelands, that I am perfectly certain climatic influences played a much greater part in its causation than personal contagion." Similar experiences of almost simultaneous occurrence of the disease over wide tracts of land have been recorded by other observers, and these accounts can be considered in conjunction with narratives of ships at sea, that have held no communication with the land and on board of which outbreaks of influenza have occurred at times when the malady has been prevalent on the coasts nearest to the position of the ships. Can the explanation be that the causal agent of the disease in harmless form is harboured by man until some atmospheric condition affords it virulence? Does it militate against such a theory that the disease may break out among islanders two or three days after the arrival of a ship from a foreign port under circumstances that suggest the spread of the malady by direct infection from person to person?

CONCLUSION.

Although from such knowledge as the medical profession has possessed at any given period, it has been argued that this or that circumstance cannot affect the prevalence or the absence of disease, yet these circumstances should be reviewed from time to time in order to ascertain whether recent discoveries in medicine or in allied subjects may supply information that in some way or another may assist to unravel one of the multitude of epidemiological problems. If we direct our attention to the discoveries which of recent years have followed investigation in regard to the physical and electrical conditions of the atmosphere we realise the important results that have followed the practical application of these discoveries to the business of the world. Surely such discoveries should

arouse a spirit of inquiry among students of epidemiology and should lead to a reopening of the question of atmospheric influence on the prevalence, and particularly on the epidemic prevalence, of disease. The difficulties associated with such an investigation are great, and much time would necessarily be occupied in a systematic attempt to carry the undertaking through, but though it extends to a sphere that to us may seem immeasurable and one that has only been explored to a very limited extent, such an inquiry after truth might obtain confirmation of an anciently conceived opinion. It might result in filling in, in some measure, the scheme of epidemic diffusion of disease sketched in broad outline by Hippocrates more than 2000 years ago.

Progress in the study of epidemiology is closely associated with precise observations in the wide realm of Nature and in the correct interpretation of these observations. This requires time and opportunity, patience and perseverance, enterprise and experience. There is nothing new or startling in this statement; it is 250 years since Sydenham wrote "true practice consists in the observations of nature."

The student in epidemiology can in all humility echo the avowal made by Fracastor 400 years ago: "I am well aware that it is difficult to say what Heaven does effect and in what fashion, and to find a certain assured cause for every event."

PERNICIOUS ANÆMIA:

AN ANALYSIS OF 117 CASES.

BY P. N. PANTON, M.B., B.CH. CAMB.,
DIRECTOR OF HALE CLINICAL LABORATORIES;

A. G. MAITLAND-JONES, M.D., M.R.C.P. LOND.,
SECOND ASSISTANT, MEDICAL UNIT, LONDON HOSPITAL;

AND

GEORGE RIDDOCH, M.D. ABERD., M.R.C.P. LOND.,
FIRST ASSISTANT, MEDICAL UNIT, LONDON HOSPITAL.

(*From the Medical Unit and Clinical Laboratories of the London Hospital.*)

THIS paper is a critical analysis of cases of pernicious anæmia admitted to the London Hospital between the years 1911 to 1920 inclusive. The cases studied are consecutive, and the clinical records have been carefully examined to exclude those that we consider doubtful; further, we have not included certain rare disorders related to pernicious anæmia, intending to present them in a subsequent paper.

Definition of Pernicious Anæmia.

It is obvious at the outset that the difficulty of defining the term "pernicious anæmia" has to be met. Such definition must include the grounds upon which we make our diagnosis, since it is evident in reading other descriptions of pernicious anæmia that cases are included which we would not ourselves consider to be examples of the disorder. We would describe the disorder as one of grave progressive anæmia for which we find no adequate explanation either in the patient's history or in our purely clinical examination. Not only is there no evidence of external blood loss but such indications of acute internal hæmolysis as deep jaundice and hæmoglobinuria are lacking; ordinary clinical evidence of hæmolysis being confined to a faint tinging of the skin not amounting to icterus and a faint discolouration of the blood serum. Further, this clinical state is associated with a constant and well-defined blood picture, of which the main features are a low red-cell count with a high colour-index, together with the presence of abnormal red cells in the peripheral circulation, and more particularly the appearance of megaloblasts. It is this association of clinical state with blood picture that defines the disorder and renders the diagnosis comparatively simple in the great majority of cases. The clinical state alone may occur with a very different pathological process, as in aplastic anæmia, where the main change results not so much from hæmolysis as from red-marrow destruction, or the blood state alone may be exactly paralleled as in AsH_3 poisoning, when the clinical condition is different. Associated with this combination of clinical state and blood picture are very constant and characteristic post-mortem findings, of which the more important are fatty degeneration, free iron pigment in the internal viscera, and hyperplasia of the red marrow.

Details of Series of Cases.

In this series of cases all examinations of the blood have been made under the direction of one of us; the histories and physical signs have been recorded by many observers, and on this account some inaccuracies must inevitably exist. The cases numbered 117 in all and showed the following facts:—

Sex.—Males 68, females 49.

Age.—The average age on admission was 46, with extremes of 20 and 68. No example of pernicious anæmia in childhood has been observed by us during the last 14 years, and among these 117 cases only 12 were less than 30 years of age.

Nationality.—Of the 117 cases, one was a German, six were Hebrews, and the remainder apparently of British nationality. The figures may be inaccurate, as in some cases no specific notes were made as to the patient's nationality.

Occupation.—Nothing was noteworthy in this respect. One patient, the youngest in the series, worked in a chemical manure factory and one was a gas-worker, but no ætiological relationship between the nature of the work and the disorder could be established.

Duration of Symptoms.—This was difficult to estimate, the onset of the disorder being so gradual; as far as could be determined, however, the average duration of symptoms up to admission to hospital was 17 months, the two extremes being seven days and six years.

1. *General Symptoms and Signs.*

(*a*) *Weakness.*—One hundred and seven patients complained of this symptom, and in 49 it was the chief complaint.

(*b*) *Change of Colour.*—Thirty-three patients had noticed a change of colour; eight of these described this change as jaundice. Whilst in hospital five patients were noted to be jaundiced; in three of these the jaundice was described as being slight in amount and bile pigment was not present in the urine or serum. In two patients only was well-marked jaundice present, and these showed bile in the urine and serum. In neither of the latter was the diagnosis confirmed post mortem. In all the patients a change of colour was noted, and in 57 the change was described as being of the classical lemon-yellow tint. The above facts accorded with our own expectation, since we consider jaundice to be rare in this disorder and have frequently observed a simple pallor to be substituted for the lemon-yellow tint. Deposition of pigment was observed in ten patients in the series, but though we are unable to exclude arsenic as an ætiological factor in all of these cases, we have satisfied ourselves that pigmentation, both local and diffuse, does occur without arsenical medication. Pigmentation of mucous membrane was not recorded.

(*c*) *Loss of Weight.*—The primary complaint of eight patients was loss of weight, and 26 cases were noted as being wasted. This point is often overlooked, and while patients as a rule are well nourished some loss of weight frequently occurs, and in a few cases is marked.

(*d*) *Pyrexia.*—Fever was noted at one time or another in 90 cases, the average range being from 99°–100° F. It was noticed in studying the temperature charts that improvement in a patient's condition was

as a rule synchronous with the disappearance of the fever. Further, the more acute the case, the more constant was the presence of the fever. While the very frequent association of pyrexia with pernicious anæmia has suggested an infective origin for the disorder, we would point out that internal hæmolysis alone is sufficient to account for the fever.

2. *Local Symptoms and Signs.*

(*a*) *Gastro-intestinal System.*—Eighty-six patients complained of symptoms referable to this system; in 53 complaints of this nature were primary. In considering gastro-intestinal symptoms we are aware of the fact that arsenic had sometimes been given before admission to hospital, but it is probable that this occurred in a few cases only. On analysis, 51 complained of vomiting, 30 of diarrhœa, 26 of anorexia, and 24 of epigastric pain. In certain cases diarrhœa was very prominent and formed the prelude to the train of symptoms. Various other complaints, such as nausea and constipation, were also given in the histories. Only eight patients complained of a painful tongue and in three of these this was the first symptom noticed. In our personally observed instances of pernicious anæmia, we have been struck by the frequency with which patients on being questioned admit that a sore tongue has at one time or another been present. And it must be noted that in the series of cases which form the basis of this paper a specific inquiry had been directed to this point in 34 instances only. Hence the available evidence upon which the frequency of this symptom could be gauged is insufficient. The associated atrophy of the tongue is well known and has been described by many observers and in particular by Hunter,[1] and recently by Sakheim.[2] Atrophic glossitis is not invariably present, and we have seen the typical changes in a patient without pernicious anæmia. It is stated by Hirschfeld[3] to be absent in bothriocephalus anæmia.

Oral Sepsis.—We have investigated as far as possible from these records the frequency of oral sepsis, and we are confronted by the difficulty of appraising what is exactly meant by this term. Of the 117 cases the state of the mouth is unknown in 13, and pyorrhœa was said to be present in 47. In addition, 13 patients had false teeth, 2 were edentulous, and 3 were noted as having few teeth. In 10 cases mention was made of carious teeth; in 8 cases the adjective "fair" was applied to the state of the mouth; in 12 cases the teeth were described as "clean"; and in 9 cases as "good." In this series, then, of 104 cases investigated on this point, in 21 only was the mouth described as free from sepsis. For purposes of comparison we have examined the mouths of 100 adults over the age of 25 in the medical wards of the London Hospital, and found that 37 had pyorrhœa, 29 had carious teeth, 20 were edentulous, and 14 had clean teeth free from sepsis. We are not of the opinion that oral sepsis has any proven ætiological significance in pernicious anæmia, although we freely admit that it cannot but be detrimental to a patient's health and may at times produce a secondary anæmia such as is caused by any other chronic suppurative process.

Gastric Secretion.—Thirty-five patients in this series were given Ewald test-meals, and in 33 there was achylia. In two patients only was free hydrochloric acid present in the test-meal filtrate; in the first it reached 0·1 per cent. with a total acidity of 43, and in the second there was a trace only with a total acidity of 35. The average total acidity of the remaining 33 cases was 10. The achylia with associated atrophy of the gastric mucous membrane seen in this disorder has attracted considerable attention, and in regard to this subject the following facts can be stated: That pernicious anæmia may occur, though rarely, without achylia; that achylia frequently occurs without pernicious anæmia; that a severe secondary anæmia, if sufficiently prolonged, may be followed by achylia and although the anæmia may be cured the achylia may persist; and that the growth of ordinary aerobic and anaerobic bacteria is prevented in a medium with an acidity represented by a positive Töpfer reaction. With these facts before us we state, somewhat tentatively, our view that while the very frequent occurrence of achylia is noteworthy and may of itself assist or even predispose towards the morbid process, we must look elsewhere for the essential ætiological factor.

Hæmatemesis.—This was complained of by three patients, and in one instance only was it copious. In this patient post-mortem examination substantiated the diagnosis of pernicious anæmia. Each of the other two patients vomited a drachm or so of blood on one occasion. All these were females.

Spleen.—The spleen was stated to be palpable in 21 cases, and the liver enlarged in 19.

(*b*) *Cardio-vascular System.*—Sixty-three patients complained of symptoms under this heading—shortness of breath on exertion, palpitation, and attacks of syncope being the main features. Sixty-two patients on examination were found to have cardiac murmurs.

(*c*) *Central Nervous System.*—Twenty-five patients complained of headache and 18 of numbness and tingling of the hands and feet. To the symptom of headache we attach no particular significance, Paræsthesiæ, however, are important, but unfortunately the difficulty that was met with in considering gastro-intestinal symptoms is again encountered here, and we are unable to exclude the influence of arsenic as a causative factor. These records of the examination of the central nervous system are not sufficiently full or uniform to justify us in drawing any conclusions, and we intend to enter into the question of subacute combined degeneration in a separate paper.

(*d*) *Genito-Urinary System.*—No symptoms worthy of note were described. Albuminuria was present in 24 patients, two passed bile pigment in the urine, and one showed glycosuria. An account of this last patient was given by Parkinson* in 1910. In no case in this series was pregnancy associated with the anæmia. The relationship of pregnancy to severe anæmia raises questions of interest which will be referred to in a subsequent paper.

(*e*) *Blood.*—We consider that our figures relating to the examination of the blood are trustworthy in so far as a uniform method of examination in the laboratory has been practised throughout under the direction of one of the authors. In one case only the blood was not examined. This patient, a male, aged 64, was moribund when admitted; there was an 18 months' history of change of colour, weakness, and loss of weight, and the autopsy showed the characteristic changes of pernicious anæmia. The blood examinations carried out on the 116 cases show on analysis the following figures:—

(1) *Red Corpuscles.*—The average count on the first admission was 1,387,312 per c.mm. with extremes of 500,000 per c.mm. and 3,370,000 per c.mm. The average count on discharge was 2,443,365 per c.mm. The average count for patients readmitted for the second time was 1,295,718 per c.mm., and on their second discharge 2,008,333 per c.mm. These figures are interesting from two points of view. First, they emphasise the fact that patients seek admission to hospital when the number of their red cells falls to the neighbourhood of 1,000,000 per c.mm. Secondly, the figures bring out the point that, although patients were usually discharged in an improved clinical condition, this did not correspond with any great increase in the number of red cells, the average count on discharge exceeding the average count on admission by approximately one million only. This fact is in harmony with our own observations, as we consider that in this disorder a return of the number of red cells to the normal is extremely rare. Megaloblasts were found in 92 out of 116 cases. Of the remaining 24 cases, 12 were in hospital for a short time only before death, and in none of the remainder were periodic examinations made thoughout the illness. We conclude that megaloblasts are probably present at some period of the disorder, even though they may not be found at one or more examinations. No actual measurement was made of the average size of the

* THE LANCET, 1910, ii., 543.

red corpuscles, which were on several occasions noted to have appeared larger than normal.

(2) *White Corpuscles.*—The average total leucocyte count on admission was 3378 per c.mm. with extremes of 600 per c.mm. and 14,000 per c.mm. The average percentage of lymphocytes was 41·3, and of eosinophils 1·7. We consider leucopœnia with a relative lymphocytosis to be an important diagnostic feature of the blood count, but one must admit that the average percentage of lymphocytes in these cases is not entirely outside the normal range.

(3) *Colour-Index.*—The average colour-index for all cases on admission was 1·01 with extremes of 0·5 and 1·6. In 15 cases in this series the colour-index was at one time or another below 0·7. In three cases the colour-index was persistently below 0·7 during the whole period of observation. Post-mortem examinations were obtained in these three cases and substantiated the diagnosis. In 87 per cent., therefore, a high colour-index was always found, and in only 2·6 per cent. was the index consistently low. We consider an index of 0·7 with a severe anæmia to be a high one and strongly suggestive of pernicious anæmia.

We should like, whilst considering the blood changes in this disorder, to emphasise as strongly as possible that a diagnosis of pernicious anæmia can only be made from a careful clinical examination combined with a complete and thorough blood examination repeated, if necessary, at intervals. A diagnosis dependent upon the results of examination of a blood film alone is unjustifiable. However complete the clinical investigation may have been the blood examination must always include the enumeration of the total red and white cells and the percentage of hæmoglobin in addition to the histology of the cells.

(*f*) *Remissions.*—We have found it difficult to make any absolute statement as to either the number or the duration of remissions from the evidence afforded by the clinical records of this series of cases. It appears to us, however, that the usual number of remissions is two, and that if this number is exceeded as many as four or five frequently occur. The duration of remissions was on the average about four months and it rarely exceeded nine months. In any series of cases of this disorder there is a certain number in which no remissions occur. In the 111 cases we have traced in this series remissions were absent in 18 and the disorder from its inception ran a steadily progressive course. The average age of the patients in this group was 46, and there were nine males and nine females. Sixteen of these patients died in hospital and post-mortem examinations were performed in nine with findings which confirmed the clinical diagnosis. In a few cases only was the blood examined periodically throughout the illness while in hospital and when back at work. In these patients a notable degree of anæmia persisted during the remissions. In only one case of apparent cure—to be referred to later—have we been able to detect an entirely normal blood count during any period of observation.

(*g*) *Duration and Prognosis.*—One hundred and eleven cases out of the total of 117 have been traced up to the present time, and of these eight only are still alive. In this connexion we purposely chose the period 1909 to 1920 in order to afford the best opportunity of following the great majority of our cases to the end. The number of patients lost sight of is six, which we consider to be very small for this class of patient, and by disregarding this number while considering the duration and mortality it is probable that our error is very small, the missing patients being evenly distributed over the period. The eight surviving patients may be divided into the following groups: 1. Recent cases running the usual course. There are two in this group, Nos. 105 and 106, both recently reported to be "progressing favourably" but not recovered sufficiently to return to work. 2. Chronic type with relapses—three examples, all women—in whom the blood is still typical of pernicious anæmia; the clinical state fluctuates between a period of well-being with ability to work and a state of asthenia requiring hospital treatment. No. 12 dates her illness from May, 1908, and has been under periodic observation since 1909. Nos. 70 and 72 were first admitted in 1915. 3. Arrested type, two cases—Nos. 68 and 86, one female, the other male, each having had periods of more than five years of freedom from symptoms. A recent clinical examination showed in both cases some of the blood changes characteristic of pernicious anæmia, but with high red-cell counts. Symptoms were absent, but complete achylia was present. The nervous system was unaffected. 4. Cured type, of which No. 1 is the only example in this series, and the only instance in our experience of pernicious anæmia in which cure has apparently occurred. This man, a farmer, aged 45, was admitted into the London Hospital in September, 1909, with a four years' history of pallor, dyspepsia, and occasional diarrhœa. He complained of marked weakness and of tingling sensations in his hands and feet. He had a blood count typical of pernicious anæmia with a red-cell count of 700,000 per c.mm., a colour-index of 1·0, and a large number of megaloblasts. Complete achylia was present. There were physical signs which definitely pointed to involvement of the spinal cord. After one month in hospital his red-cell count increased to 4,100,000 per c.mm. with an index of 1·0, and nucleated red cells disappeared. After a brief period of convalescence he returned to work and from that time has never had a day's illness. At the present day his blood is normal, the achylia persists, the subjective and objective signs of involvement of the central nervous system are unaltered, and his physical state is otherwise perfect. A complete remission of 12 years has therefore occurred, and the patient appears to be in perfect health except for minor disabilities resulting from the original attack.

We have divided the remaining 103 cases into two groups, one with remissions and one without. The first group numbers 84 cases, in which the average duration of the disorder from the first symptom was 34 months and from the date of admission to hospital was 15 months. The second group, consisting of those cases without remissions, numbers 19, and the duration was nine months from the beginning of symptoms and six and a half weeks from the date of admission into hospital. It was not surprising to find that only eight patients out of the total of 111 are alive at the present time; rather were we surprised to find so many still surviving. We wish to emphasise this high mortality rate which is in complete accord with our own experience, since it has frequently been suggested that pernicious anæmia is a disorder in which recovery is not rare.

We therefore state that in our opinion recovery from pernicious anæmia is an event of such rarity that it cannot be accepted in any case without the fullest confirmation. With regard to those exceptional patients in whom the disorder has become arrested or apparently cured, we are unable to bring forward any suggestions as to the cause of this arrest or to describe any features by which they can be recognised in the early stage of the illness.

Treatment.

Here we propose to discuss certain aspects only of the treatment of pernicious anæmia.

1. *Oral Sepsis.*—The presence of gross septic infection of the mouth obviously calls for treatment, as it would in any other morbid state; but we wish to enter a protest against the indiscriminate extraction of teeth and to point out that the presence of pernicious anæmia is no indication per se for rendering the patient edentulous. The majority of the patients in this series received the most thorough dental treatment. The condition of some was made miserable by wholesale extractions of the teeth and of these a number survived long enough to contemplate, but not to use, the new dentures. Nor have we satisfied ourselves of the cure of a single example of pernicious anæmia by the treatment of oral sepsis. We would therefore suggest that dental treatment should be limited to definite septic foci and otherwise should so far as possible be conservative.

The treatment of dental sepsis involves a consideration of vaccine therapy. The recent work of McIntosh

and Lazarus-Barlow[4] strongly suggests that the bacteria commonly used in the past as the basis of vaccine therapy for oral sepsis are not themselves the cause of dental caries. Our own experience of vaccine therapy in this connexion is that it is rarely, if ever, of any value, and here we would take the strongest possible exception to the advice of Hurst and Bell[5] upon the treatment of pernicious anæmia. These authors advise the use of streptococcal vaccines derived from the mouth, the duodenal contents, the fæces, and the urine. We fail to find any justification for such a procedure.

2. *Achylia.*—The treatment of this condition by the giving of artificial gastric juice is theoretically indicated in the great majority of cases and in practice, if it does not lead to cure, is frequently of value. The large doses of hydrochloric acid recommended by Hurst as the result of his experimental investigations seem to us worthy of trial.

3. *Arsenic.*—This drug, in one form or another, was given to practically all the patients in this series, and it is apparently still regarded as the most effective therapeutic agent that we possess for the treatment of pernicious anæmia. That the drug has no curative action is known; that it has any effective ameliorative action we are inclined to doubt. Patients often continue to deteriorate while taking liquor arsenicalis and may begin to improve suddenly when organic arsenic is substituted for it. The reverse has also been observed. In estimating the effect of arsenic as a therapeutic agent, it is necessary to consider the probability that during a remission a balance is struck between the hæmolytic and regenerative processes. In a relapse the hæmolytic factor is predominant, and tends to remain so until a red count level of 1,000,000 per c.mm. or less is reached. Regeneration then tends to outstrip hæmolysis with a corresponding improvement in the patient's state. It is usually towards the end of a relapse that the patient comes for treatment and arsenic is prescribed. The subsequent improvement which tends spontaneously to occur may be wrongly attributed to the arsenic. One of the patients in this series was treated with arsenic and rapidly improved; but when readmitted later and treated without any drugs at all he made an equally rapid improvement. Although we doubt whether arsenic has any real therapeutic value in pernicious anæmia, in default of any specific remedy for this disorder we continue to use it.

Divergent views, based both upon clinical and experimental observation, have been expressed by a number of writers upon the value of arsenic as a blood-forming agent. These views have recently been summarised by Roch and Katzenlebogen,[6] who give a bibliography bearing upon the question. The summary of these authors, together with the work done by them upon a new organic arsenical preparation —*arsylène*—appears to us to justify the doubt concerning the value of arsenic to which we call attention. Germanium dioxide,[7] which has been shown experimentally to increase the number of red cells, has been found to have no therapeutic value in the treatment of this disorder.

4. *Blood Transfusion.*—A few patients in this series were treated by blood transfusion and we have so treated others. The conclusion to which we have come is that unless for some particular purpose it is advisable to prolong life for a period blood transfusions are inadvisable. When the transfused blood is used up more has to be given, and in our experience we have been unable to detect any evidence of real recovery of the patient's blood-forming tissues to follow the transfusion.

5. *Splenectomy.*—This operation was originally undertaken with a view to the cure of pernicious anæmia, and we have been unable to follow the theory underlying this procedure. More recently William Mayo[8] has advocated splenectomy in the hope not of cure, but of prolongation of life, on the theoretical ground that "the red cells are born feeble" and are therefore too rapidly destroyed by the spleen. His advocacy has been strengthened by Giffin and Szlapka's[9] analysis of the records of 50 patients treated by splenectomy at the Mayo Clinic. We have, so far as possible, compared our figures with those of Giffin and Szlapka. Of our 111 cases which have been traced, 105 were first admitted to hospital more than three years ago; of these 105, one was submitted to splenectomy and is therefore not included. Of these 104 cases, 17, or 16·3 per cent., survived more than three years; of the 17 cases, 11, or 10·6 per cent., survived more than four and a half years, and two others are still alive but having not yet reached the four and a half year limit are not included. The Mayo Clinic figures give an operative mortality in their 50 patients of 6 per cent. Of the 47 survivors 10 patients, or 21·3 per cent., lived more than three years after the operation and 5 patients, or 10·6 per cent., lived more than four and a half years. Giffin and Szlapka therefore omit the operative mortality in estimating the survival period. This is reasonable for the purpose of estimating the effect of splenectomy on the course of the disease, although it would have to be allowed for in advising any patient on the operation. The Mayo Clinic series of cases, therefore, gives for 21·3 per cent. a period of three years and our figures 16·3 per cent., a difference of only 5 per cent. Taking the survival period of four and a half years the figure in each case is 10·6 per cent. These figures are remarkably similar considering the small number of cases concerned, and the conclusion of Giffin and Szlapka that splenectomy prolonged life in at least 20 per cent. of their cases is not substantiated. If, indeed, we compare the class of patient admitted to the Mayo Clinic with that of the London Hospital we shall probably find that the average state on admission is very much less grave in the class of patient admitted to the Mayo Clinic. Patients seen by us for the first time in private practice are almost invariably in a less advanced stage of the disease than hospital patients. We do not therefore consider that any case for splenectomy has been made out.

Diagnosis.

A consideration of all the disorders that have been confused with pernicious anæmia lies outside the scope of this paper, and we propose to limit our discussion to the commoner difficulties in diagnosis. The identification of the disorder is based on two forms of examination—clinical and hæmatological—and we will consider these separately.

Clinical Examination.—It is of primary importance to determine whether there is any demonstrable cause for the patient's illness. A careful inquiry should be made for a history of loss of blood, particularly from the gastro-intestinal tract. A continuous small blood loss from hæmorrhoids or larger intermittent bleedings from a duodenal or gastric ulcer produce at times a clinical picture not unlike pernicious anæmia. Profuse hæmorrhage may, however, occur, though rarely in pernicious anæmia. Gastro-intestinal symptoms are extremely common and are responsible to a large extent for the difficulty in diagnosis between pernicious anæmia and cancer of the stomach. In carcinoma, however, pain is a more prominent feature, whilst in pernicious anæmia the complaint is of discomfort rather than pain. Additional points of importance are the profound anæmia and marked persistent wasting that occur in cancer of the stomach. The languor and weakness with the gastro-intestinal symptoms of pernicious anæmia are at times suggestive of Addison's disease, and the diagnosis may be further confused by the presence of pigmentation which at times occurs in pernicious anæmia. The most helpful differential point clinically is the characteristic lowering of blood pressure in Addison's disease. Two points to which attention should be directed in the history are soreness of the tongue and persistent paræsthesia of the extremities. Either of these two symptoms is suggestive. The general aspect of the patient gives information of value. We believe that in the majority of patients the appearance and colour of the face are very suggestive, but too much emphasis should not be

laid on the colour alone. Patients with pernicious anæmia are frequently pallid only, and those with a secondary anæmia of long standing may show a lemon tint. It may be said that, as a rule, the patient with pernicious anæmia looks more ill than he feels, while the patient with secondary anæmia feels more ill than he looks. The state of nutrition should be observed; marked wasting would be favourable to a diagnosis other than pernicious anæmia, although some loss of flesh in this disorder occurs not uncommonly, as we have already pointed out.

The physical examination may show an enlarged spleen and liver, hæmic murmurs, and retinal hæmorrhages. With regard to the spleen, if it becomes enlarged, it is "palpable" only; gross enlargement of this region should suggest a revision of the diagnosis. Confusion has arisen between pernicious anæmia and subacute bacterial endocarditis, as in both disorders, anæmia, pyrexia, cardiac murmurs, and a palpable spleen may be found. We have recently observed a case in which the differential diagnosis was extremely difficult on clinical grounds. The frequent damage to the aortic cusps and kidneys in endocarditis are the factors, apart from the blood examination, which give most assistance in the differential diagnosis. The achylia so often present is of value, and in an obscure case we would hesitate to diagnose pernicious anæmia if free hydrochloric acid could be demonstrated in the test-meal.

On *hæmatological* grounds the blood picture of pernicious anæmia has been sufficiently indicated and is indeed so well recognised as to require no further description here, but it remains to mention certain pathological states in which the blood condition of pernicious anæmia may be more or less closely simulated.

Secondary Anæmia.—Here the low colour-index and absence of megaloblasts give a blood picture entirely distinct from that of pernicious anæmia. It is true that cases arise in which a definite diagnosis may not be possible at one or even two examinations. The colour-index may be low on occasion in pernicious anæmia, and megaloblasts absent. More rarely the index may be high in secondary anæmia, and still more rarely megaloblasts may be present. These points are known and have been unduly laboured. We are unacquainted with such series of cases as are described, for example, by William Hunter,[10] who appears to find hæmatological confusion between the pernicious and secondary types of anæmia a matter of common occurrence. We are not concerned here, as is Hunter[10] in his latest paper, with the question of whether the cord changes so frequently associated with pernicious anæmia are to be found also in secondary anæmia; that is a matter upon which the distinction of the two types of anæmia does not depend and which we also have under investigation. We state that the distinction between primary and secondary anæmia can always be made if our examinations are properly conducted, and we rely for this statement upon the evidence of our investigations. We have covered here a period of 11 years in the records of the London Hospital, a period during which occurred 117 cases of pernicious anæmia and a far greater number of cases of secondary anæmia. Every blood examination in all these cases was made under our direction; nearly all the patients with pernicious anæmia have been followed till death. Large numbers of post-mortem examinations have been made, both in these cases and in cases of secondary anæmia, and in not a single instance have we been able to trace a failure to distinguish between primary and secondary anæmia. We regard this purely as evidence that such distinction is not as a rule difficult, and we admit that at any time an error may occur. We have, indeed, at another period made such an error, through careless observation, on one occasion to our knowledge and possibly on others. Our sole point is that such mistaken diagnoses should be too rare for any one observer to produce a series of them.

Pregnancy.—The puerperium or the period shortly before child-birth may be associated with an anæmia disproportionate to such hæmorrhage or sepsis as may have taken place. The hæmatological picture in these cases may, though rarely, closely simulate that of pernicious anæmia. The appearance of nucleated red cells, including megaloblasts, in the peripheral circulation is common during the puerperium, and though the colour-index is usually low, it may be high. Patients with severe anæmia of this sort frequently recover completely and rapidly regain a normal blood picture. We consider that a diagnosis of pernicious anæmia should never be made in the puerperal woman without the fullest investigation extending over a considerable period.

Myelophthisic Anæmia.—This condition is rare in general hospitals, but possibly quite common in infirmaries or homes for incurables. We have seen several examples of it. The blood film in such cases may be typical of pernicious anæmia, nucleated red cells, including megaloblasts, being often very numerous. The colour-index, however, remains low. The complete blood picture of numerous megaloblasts with a low index is sufficiently striking to have enabled us to make the diagnosis of myelophthisic anæmia from a blood examination alone.

Aplastic Anæmia.—This gives a grave anæmia with high colour-index, but morphological red-cell changes, other than anisocytosis, are absent. The leucopenia and relative lymphocytosis become progressively more extreme in aplastic than in pernicious anæmia.

Arseniuretted Hydrogen Poisoning.—This may give a blood picture identical with that of pernicious anæmia, aut complete recovery to the normal takes place bnd the associated conditions of deep jaundice and hæmoglobinuria are distinctive.

Acholuric Jaundice.—This has the blood picture of secondary anæmia and the diagnostic feature of red cell fragility.

The Leukæmias.—These are readily recognised hæmatologically and only on rare occasions and for a brief period during their course may the question of differential diagnosis from pernicious anæmia arise. The colour-index, usually low, may be high and to such cases, when unaccompanied by a marked leucocytosis, the term leukanæmia has been applied. We doubt the necessity of the term and as a pitfall in diagnosis it is rarely met with and easily avoided.

The Infantile Anæmias.—In infancy and below the age of 10 years all hæmatological diagnosis is difficult. The typical blood picture of pernicious anæmia, however, is very rarely met with in infants. The only close approach to such a picture in our experience was met with in a case of aplastic anæmia in a child.

Unclassified Anæmias.—There are certain rare forms of anæmia which differ clinically from pernicious anæmia, but in their blood picture are identical. We propose to describe such few examples as we are acquainted with in a subsequent paper.

Gastro-intestinal Disorders.—Carcinoma of the stomach has often been stated to give the blood picture of pernicious anæmia. It has happened to us in one week to see two cases diagnosed as pernicious anæmia on clinical and blood-film findings. In both we found the blood changes of secondary anæmia and both were proved to have carcinoma of the stomach. Gastric cancer may exceptionally require particular care to distinguish it from pernicious anæmia, but does not otherwise cause more difficulty than any other form of secondary anæmia. A case of severe anæmia following gastrectomy has been described by Hartman,[11] but the case in question, though of great interest, is not a complete example of pernicious anæmia. Such events require further investigation. Sprue is a condition we have rarely met with, but Dr. H. L. Tidy has informed us of a case in which the blood changes were identically those of pernicious anæmia. Nor have we any personal experience of

bothriocephalus anæmia, in which condition the blood changes may be typical of a primary anæmia.

In the preparation of this analysis we have been greatly indebted to the staff of the London Hospital, who have given us free access to all the patients under their care.

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INTRATHORACIC CATASTROPHES SIMULATING THE ACUTE ABDOMEN.

BY J. HOGARTH PRINGLE, F.R.C.S. ENG.,
SURGEON, ROYAL INFIRMARY, GLASGOW.

I RECORD the two following cases for two reasons. First, the conditions from which the patients were actually suffering are not common; and secondly, the symptoms presented, on admission to hospital, were so remarkably similar to those one meets with in abdominal emergencies that looking back upon them now I do not see how any other opinion could have been arrived at than that they were both instances of serious intra-abdominal lesions. The first case came under notice in 1909, and until the second patient was seen 13 years later I had met with nothing of the same nature. Nor had I seen any record, or even a suggestion, that symptoms resembling in any degree those of what is known as "the acute abdomen" could present themselves in cases of what one may term "intrathoracic catastrophes."

CASE 1.—A storeman, aged 65, was sent in from the country to the Glasgow Royal Infirmary on Jan. 6th, 1909, with the diagnosis "probable perforation of stomach." The patient had been a heavy drinker, and for the last two years had developed symptoms of gastritis, pain after food, and vomiting, especially after drinking bouts. He had had a heavy drinking bout "at the New Year," and this illness for which he was brought to hospital followed directly upon it. His friends said that on Jan. 2nd he appeared to be dazed and ill, and took little food. He went to his work on the 3rd, although advised not to do so, and he continued at it until mid-day on the 6th, when he was suddenly seized with agonising pain in the epigastric region and collapsed in consequence. He had vomited blood on several occasions, both on the 4th and 5th, but although he vomited several times after the onset of pain on the 6th, we were told there was no blood in the vomitus that day. He did not vomit after admission. A history of biliary colic could not be obtained.

Condition on Examination.—The patient was admitted to hospital ten hours after the onset of pain; he was a big, burly man suffering intense abdominal pain. He held on to his abdomen with both hands, often rubbing the abdominal wall, and begged for operation to get relief. Abdominal wall hard and rigid all over and abdomen a little distended, distension being specially marked in epigastric and hypochondriac areas; slight tenderness over right iliac fossa, but pain and tenderness most severe in epigastric zone. Liver dullness was not diminished. No fullness in Douglas's pouch, and no tenderness elicited on rectal examination. Patient distinctly cyanosed, but not sweating. Heart sounds inaudible owing to noisy breathing, the pulse 118, rather feeble. Temperature 99° F. Respiration mainly thoracic. Leucocyte count 13,200.

Diagnosis.—From the history, the general appearance of the man, and the state of his abdomen, I thought the condition was probably acute pancreatitis rather than perforation of stomach or duodenum. The patient was quickly prepared and taken to the operating theatre, but by the time he got there his general condition had changed so much for the worse that no operation was undertaken. No anæsthetic was given, and he died soon after being put back into bed, one hour and a half after admission.

Post-mortem Examination.—Body remarkably well-developed. Thorax: Pericardium healthy, contained about 1½ oz. deeply blood-stained fluid. Heart enlarged, with a considerable deposit of fat on it. Along distribution of left coronary artery an area of hæmorrhage with softening at parts. Left ventricle hypertrophied, but myocardium appeared of good quality. Valves of heart appeared healthy and competent. Aorta dilated and showed considerable atheroma throughout. On dissection of left coronary artery the orifice was free, but half an inch from this the vessel was completely blocked by thrombus which extended for nearly half an inch, and appeared to arise from a hard, calcareous patch at this region. Beyond this part coronary unobstructed but markedly atheromatous. Right coronary artery free, but lumen narrowed from advanced atheromatous change, much pultaceous matter adhering to scissors when vessel was slit up. In lower part of intraventricular septum extensive necrosis and destruction of the muscular tissue with a large, gaping, irregular orifice communicating with the right ventricle. Almost the entire lower half of septum, yellowish-white in colour, soft, and breaking down on slight pressure. Apart from this, no apparent degeneration of myocardium. Lungs: Left lung free. Pleural cavity contained about 12 oz. blood-stained fluid. Lung healthy on section. Right lung extensively adherent from old pleurisy. Abdomen: Remarkable fatty development all over. Liver adherent to diaphragm over right lobe; slightly fatty on section. Gall-bladder healthy; no gall-stones; spleen and pancreas healthy; kidneys engorged with blood showing some small cysts. Adrenals, bladder, and ureters healthy. Small shallow ulcer near cardiac end of stomach. Intestines normal.

CASE 2.—Labourer, aged 62, sent into the Glasgow Royal Infirmary from the country on Dec. 18th, 1921, with diagnosis of "strangulated left femoral hernia." He stated that ten days before admission he had been engaged on unusually heavy out-door work; he had had a good deal of pain in his neck for seven days, and had been treated during that time for neuritis; he had not worked since the onset of this pain. On the day of admission he wakened at 5 A.M. and stretched himself vigorously in bed, raising his arms above his shoulders in doing so. This movement was followed by the onset of the most agonising pain in the lower abdomen, chiefly felt in the left iliac fossa. He stated that at the moment he had the sensation as of "something giving way in his belly." About an hour later his medical attendant diagnosed his condition as a left femoral hernia and applied taxis for a considerable time without any relief to the patient, whom he then advised to go to hospital. The patient arrived shortly before 11 A.M.

Condition on Examination.—Patient was well-built but spare. His face was drawn, and he was cyanosed. Intense pain immediately above medial extremity of left inguinal ligament; he writhed about in bed and cried out, continually rubbing or holding abdominal wall rather below umbilicus and urgently begged for an operation. Tissues in neighbourhood of left saphenous opening showed signs of recent bruising; a slight fullness there, but no tumour. This region very tender, and on palpation a fine crepitus could be felt—whether due to a small quantity of gas or to fragmenting blood-clot in the tissues I could not determine. No impulse when patient strained. Some enlarged glands under right inguinal ligament. No distension of abdomen, but abdominal muscles absolutely board-like. Respiration chiefly thoracic. A small umbilical hernia and a small epigastric hernia about the size of a cherry; the former reducible, but not the latter. Hepatic dullness normal, no sign of fluid in flanks, nothing abnormal felt by rectal examination. Patient had not vomited, bowels had not moved since onset of pain, but had acted daily up to and including day before admission. Heart sounds, not well heard owing to patient's noisy breathing and groaning, seemed normal. Pulse 84, fair tension; respirations 28; lungs normal. Temperature 98° F. Blood pressure not taken.

Operation.—At the time there were two other cases of "acute abdomen" in the ward to be dealt with, all three patients having been admitted within half an hour and all extremely ill. On account of this man's extreme pain I decided to operate for him first; although the cause of his symptoms was not clear, I thought they might be due to thrombosis of his mesenteric vessels. I could not accept the idea of the femoral hernia, though it seemed advisable to explore the left femoral ring, chiefly because of the crepitation. Anæsthesia was commenced exactly half an hour after he was first brought to the ward. I explored the left femoral ring first, and found the tissues infiltrated with blood but could not recognise any gas in them. The ring was found closed, so the wound was sutured and the abdomen opened, but nothing abnormal beyond the two small ventral herniæ noted above was found. All hernial rings on both sides were closed. The mesenteric vessels, pancreas, spleen, and liver normal. Gall-bladder tense and thin-walled; no stones in it or in the common duct. Bowel showed no sign of constriction.

The patient died rather suddenly two hours after having been put back to bed, the pulse having been quite good up to the time of his collapse; at completion of operation his general condition did not seem any worse than before it was commenced, so that information of his sudden collapse came somewhat as a surprise, and for the first time the possibility of some intrathoracic lesion occurred to me. We were fortunate in obtaining permission for a post-mortem examination.

Post-mortem Examination.—Nothing abnormal in abdomen beyond a few small gall-stones in a very tense gall-bladder and slight interstitial nephritis. Spleen: Signs of peri-splenitis of old-standing. All hernial rings closed. Left pleural cavity contained rather more than three pints of blood, partly clotted. Left lung collapsed. Both lungs showed a considerable degree of anthracosis and some hypostatic congestion. Tissues round œsophagus and descending aorta infiltrated with blood-clot down to diaphragm. Left ventricle of heart dilated and hypertrophied. Cardiac muscle flabby. Calcareous deposits along attached convex margin of aortic cusps and also in aorta immediately above. Cusps slightly adherent to each other along their edges. Other valves normal. Coronary arteries showed advanced patchy atheroma with calcareous changes. Aorta did not show extensive disease. Several patches of atheroma near orifices of intercostal arteries, and one large transverse scar near origin of left subclavian artery on arch of aorta. The scar, 1½ to 2 in. long, proximal to origin of left subclavian artery, was at a distance of 2 inches from the actual rupture, which was just distal to the origin of the left subclavian artery. There was a little tear in the intima about half an inch long with blood-stained margins. Rupture of middle and outer coats really more a leakage than an actual tear.

Remarks.

I do not think I have ever seen patients who appeared to suffer greater pain than these two. It is curious that while each of them experienced pain in the iliac fossa, the cardiac patient referred his to the right, while the man with the aortic lesion referred his to the left fossa. The latter, undoubtedly, had his most severe pain in the lower abdomen, while the former as certainly had his in the epigastric zone. It is worthy of note that the first patient, sent in as a perforated gastric ulcer, actually had a shallow ulcer in the stomach, although no peritoneal infection had occurred from it. The pain these men suffered was anginal in type, probably caused by tension in the right ventricle in the case of the necrosed perforated septum, and in the second patient by blood extravasating slowly into the periaortic tissues. I am not aware that the possibility of lesions of the great vascular organs of the thorax being mistaken for urgent abdominal emergencies has been suggested. Yet I believe it will be admitted that in both patients the clinical picture justified the assumption of some abdominal disaster. While it is recognised that a patient suffering from angina pectoris will sometimes complain of pain in the epigastric area, I believe it does not happen that rigidity of the whole abdominal wall is seen in these cases; for the fifth, sixth, and seventh dorsal nerves, which are generally supposed to be responsible for the epigastric pain, only supply a small segment of the muscles, and presumably only that portion would become fixed in such cases.

Even in relation to the subject of dissecting aneurysm I do not find any writer suggesting that abdominal pain along with rigidity of the abdominal wall might be expected to be present, and yet it is the vascular lesion which would appear pre-eminently liable to produce these symptoms. The only disease of the intrathoracic vascular organs, other than that which causes angina pectoris, that seems to be recognised as a possible cause of abdominal pain is pericarditis. Whilst MacKenzie[1] says that pericarditis is essentially a painless condition, McPhedron[2] writes that "pain may be referred to the shoulder or left scapular region but oftener in the epigastrium, where in some cases it is very severe." In the *Medical Times*, 1857, vol. ii., p. 249, there is a short note referring to a clinical lecture by Dr. Barlow, which states that "in commenting on a case under his care at Guy's he directed the attention of his class to the important indication furnished by the unduly restricted action of the diaphragm in certain cases of thoracic inflammation. He had specially noticed it in pericarditis." Wynter[3] writes that in acute pericarditis absence of abdominal movement is "as obvious as in abdominal disorders though rigidity and tenderness are for the most part absent." Cope[4] says that "Cardiac disease sometimes causes epigastric pain and vomiting, but never leads to abdominal rigidity or other signs of peritonitis."

It is, however, just the association of pain with rigidity that is so important. Epigastric pain occurring by itself may be, and often is, a trivial sign. Its significance is entirely altered when there is in addition a hard unyielding abdominal wall. Of late, writers dealing with abdominal emergencies have insisted that with perforation of a hollow organ the patient "never moves," but "lies absolutely still," &c. While this is true in the majority of cases it does not apply to all.

On March 6th, 1922, a woman with a history suggesting gastric ulcer, was admitted to hospital, stating that she wakened at 3 A.M. that day, had the desire to vomit, rose and vomited one mouthful of sour fluid, and at once experienced a feeling as if something had given way in her abdomen. This was followed by most intense pain in right side of abdomen. She was admitted to the ward eight hours later much collapsed, with face drawn and lips blue; pulse 96; temperature 99° F.; respirations 26, entirely thoracic. Blood pressure not noted. She writhed all over the bed, rubbing her hands over the belly when she was not holding on to the abdominal wall, which was absolutely rigid and hard and more so below than above the umbilicus. She continually begged for an operation for relief of her pain which was chiefly felt in the right side of the abdomen.

We were all struck by the close resemblance between the state of this patient and that of the man with the leaking aorta. The chief clinical difference between the two was that in the man hepatic dullness was present, whereas in the woman it was absent. Immediate operation was carried out and a perforation in the anterior wall of the stomach was found 2 inches below its cardiac orifice. I have on several occasions seen a patient with a perforation of stomach or duodenum behave in precisely the same manner as this woman.

[1] Dis. of Heart, third edition, p. 282.
[2] Osler and Macrae, vol. iv., p. 46.

THE TREATMENT OF KALA-AZAR BY "STIBENYL."

A REPORT ON TEN CASES.

BY L. E. NAPIER, M.R.C.S. ENG.,

IN CHARGE OF THE KALA-AZAR RESEARCH LABORATORY, CALCUTTA SCHOOL OF TROPICAL MEDICINE, AND KALA-AZAR WARD, CARMICHAEL HOSPITAL FOR TROPICAL DISEASES, CALCUTTA.

IN 1916 Caronia[1] treated four children suffering from kala-azar with an organic compound of antimony, acetyl-para-aminophenyl-stibiate of soda. One child, evidently a very severe case, died, but the other three were apparently cured. The respective ages of the children were 3½, 2, and 1 year, and the approximate amounts of the salt that was given, 3·60, 1·0 and 0·66 g. over periods of 3 months, 16 days, and 10 days respectively. It was given intramuscularly in each case. If one accepts the suggestion that the fourth case was very advanced, and probably hopeless from the beginning, the results of the treatment with this compound were very encouraging from three points of view. First, the total amount administered was more than the amount of sodium or potassium antimony tartrate that one would care to give in the same period of time to an adult; secondly, in the second and third cases the cure was very rapidly effected; and finally, the drug could apparently be tolerated when injected into the patient's muscles.

[3] Clin. Journal, 1913, vol. xlii., p. 185.
[4] Acute Abdomen, p. 209.

In 1920 Manson-Bahr,[2] encouraged by these results, used this compound in a case of kala-azar and in a case of trypanosomiasis with good results. Messrs. Allen and Hanburys prepared this compound, and put it on the market under the name "Stibenyl." It was sold in sets of eight ampoules, each ampoule containing one dose of the compound in powder form. Doses of 0·1, 0·15, 0·2, 0·3, 0·4, 0·5, 0·6, and 0·8 g., in a freshly prepared 2 per cent. solution in distilled water, and given intravenously on alternate days, the total amount being 3·05 g., given over a period of 15 days, were advised. Acetyl-para-aminophenyl-stibiate of soda is said to contain 38·5 per cent. of antimony, which is a slightly larger proportion of antimony than either the sodium or potassium tartrate salts contain, so that, if the antimony is considered the curative factor, a total dose of 3·05 g. is well above the minimum curative dose, which by many authorities is considered to be 2 g. of sodium antimony tartrate. Trevan[3] has shown that the minimum lethal dose when given intravenously to rats is 133 mg. per kg., or eight times that of potassium antimony tartrate (16 mg. per kg.), so that the suggested dosage is well within the margin of safety.

In February, 1921, Mackie[4] pointed out that great care should be exercised in the use of this compound in the treatment of kala-azar, and mentioned the three cases treated by him in the Medical College Hospital, Calcutta, which constitute the first three cases of this series, on which I myself had done the preliminary blood and spleen puncture examinations and of which further details are given below. In May Manson-Bahr[5] wrote a letter to THE LANCET saying that he also had treated a case in which 0·4 g. of stibenyl had given rise to severe symptoms, but that he still considered that the drug might prove useful in the treatment of kala-azar. In June a letter from Forsyth[6] was published in the *Indian Medical Gazette* in which he said that his experience with stibenyl had been similar to that of Mackie, and not very encouraging. In August Gatt[7] reported a case which he had treated with stibenyl and which ended fatally. This case was obviously hopeless from the beginning, but the fact that Major Gatt employed stibenyl in preference to sodium antimony tartrate shows that he was under the impression that the former was a more satisfactory form of treatment.

A Series of Cases.

As far as I know no further reports of the result of treatment with this compound have been published. A short report of my own experience may be of value to those who are interested in the treatment of leishmaniasis and other conditions in which antimony compounds are used.

Cases are given in their chronological order.

CASE 1.—Major Mackie's case. Indian male aged 19. Fever on and off for one year. Spleen to umbilicus, tender palpable liver. Not markedly emaciated. Weight, 67 lb. Irregular temperature rising to 101° F. Blood: Red cells, 3,190,000; white cells, 11,618; polymorph., 9298 per c.mm. Spleen puncture: Leishman-Donovan (L.-D.) bodies found. Treatment as follows: Jan. 6th, 0·1 g. stibenyl; this was followed in about one hour by severe pain over the spleen, vomiting and diarrhœa (14 times); temp. 102°. 10th, 0·033 g.; 12th, 0·050 g.; and 14th, 0·066 g.; no obvious reaction. The patient now showed more marked lung symptoms, but was otherwise well. The treatment was discontinued in favour of treatment with sodium antimony tartrate.

CASE 2.—Major Mackie's case. Indian male aged 24; fever for one year; weakness. Spleen four fingers, liver three fingers below costal margin. Emaciated. Irregular fever up to 100·5 F. Pulse-rate 100. Blood: Red cells, 4,130,000; white cells, 5040; polymorph., 2520 per c.mm. No parasites in peripheral blood. Spleen puncture: L.-D. bodies found. Treatment as follows: Jan. 6th, 0·1 g. stibenyl; this was followed by vomiting and diarrhœa (12 times), pain over spleen; temp. 101·5°. 10th, 0·033 g.; 12th, 0·05 g.; and 14th, 0·066 g.; no obvious reaction. This treatment was then discontinued in favour of treatment with sodium antimony tartrate. The patient eventually was cured.

CASE 3.—Major Mackie's case. Indian male aged 16. High fever for some months. Spleen to umbilicus, liver 1½ in. below costal margin. Emaciated. Blood: Red cells, 3,400,000; white cells, 1280; polymorph., 640 per c.mm. Spleen puncture: Jan. 3rd, no L.-D. bodies found; on the 6th (pyrexial period), L.-D. bodies found, also growth of flagellates on N.N.N. medium. Treatment as follows: Jan. 10th, 0·033 g. stibenyl; and 12th, 0·050 g.; no obvious reaction. 14th, 0·066 g.; no obvious reaction, but pulse became irregular and weak, and patient died at 4 A.M. on following day. Post-mortem not permitted, but spleen and liver post-mortem puncture showed L.-D. bodies. Treatment with this compound was temporarily suspended, but a few months later, at Major Mackie's suggestion, I decided to give it another trial.

CASE 4.—African native, male aged 32, who had been under treatment for kala-azar for a short time a few months previously, but after the first few injections had left hospital. His condition had relapsed, and he had now had fever for a month. He was weak and emaciated. Mitral regurgitant murmur. Spleen 3 in. below the costal margin. Blood: Total white cells, 3750 per c.mm. Spleen puncture: L.-D. bodies present. Urine: A trace of albumin. Treatment as follows: May 25th, 0·05 g. stibenyl, and 27th, 0·10 g.; no obvious reaction. 29th, 0·15 g.; no obvious reaction, except that temp. was 101° F. Blood pressure fell from 100 to 94 after the injection. 31st, patient's condition was not good, so that no injection was given. From this time onwards pulse became weaker and he eventually died on June 1st. There was no post-mortem.

CASE 5.—Anglo-Indian female aged 28. Mild case. Daily fever for one month, but not sufficient to interfere with her work as a clerk. Loss of weight. Spleen 5 in. below costal margin, liver not palpable. Weight 78 lb. Blood: Total white cells, 4000. Spleen puncture: L.-D. bodies found. Treatment as follows: 2·8 g. stibenyl given in nine injections over a period of 34 days, doses being 0·05, 0·1, 0·2, 0·3, 0·4, 0·45, 0·4, 0·45 and 0·45 g. For the first four injections there was no obvious reaction; after the fifth there was a decided rise of temperature; after the sixth the patient vomited; after the seventh and eighth diarrhœa and vomiting occurred; and after the last there was severe diarrhœa and vomiting, together with collapse, which lasted for two hours. In first instances the symptoms came on two hours after the completion of the injections, but in the last two, 20 minutes and 10 minutes after. Result: Apparent cure, spleen just palpable. Spleen puncture: Direct smear and culture negative. White blood cells: 5600 per c.mm. Weight 85½ lb.

CASE 6.—Indian male aged 17. Moderately severe case. Fever for six months. Emaciated, anæmic. Spleen 6 in., liver 2½ in. below costal margin. Blood: Red cells, 3,500,000; white cells, 3800; polymorph., 1558 per c.mm. Spleen puncture: L.-D. bodies numerous. Urine: Trace of albumin. Treatment as follows: Stibenyl, 3·275 g., in 12 doses, in 35 days, commencing with 0·025 g. and rising to a maximum of 0·45 g. After the sixth dose of 0·3 g., and after all subsequent doses, diarrhœa and vomiting occurred, and after the last dose the patient became collapsed. Result: Apparent cure; no fever after the last dose while in hospital (two weeks). Blood: White cells, 5750. General blood picture improved. Spleen 4 in., liver 1 in. below costal margin. Spleen puncture: Direct smear and culture negative.

Thinking that it was possible that the sample of stibenyl that we had been using might have undergone some change through having been kept for some months in a hot climate, I decided to obtain some more of this compound directly from England. I obtained one "treatment" a couple of days after its arrival in this country, and kept it in the cool incubator. This sample appeared to be the same as the previous one, except that the maximum dose advocated was only 0·6 g., as against 0·8 g. of the previous sample, and the total was only 2·25 g. instead of 3·05 g.

CASE 7.—Anglo-Indian female aged 14. Moderately severe case. Eight months' fever. Treated as enteric for six months previously. Dysenteric motions for one month. Spleen 5 in. below costal margin, liver just palpable. Fever 100°–102° F. Blood: White cells, 5350 per c.mm. Spleen puncture: L.-D. bodies found. Treatment as follows: Stibenyl, 2·25 g., in 13 injections, over a period of 34 days, commencing with 0·033 and increasing to 0·3 g. No obvious reaction followed these injections. Result: No L.-D. bodies seen in spleen puncture smear, but a flagellate culture was grown from the material on N.N.N. medium. Weight increased 2 lb. Fever rising to 100° occasionally. Spleen 3 in. below costal margin. White blood count, 5600 per c.mm.

Further treatment: Potassium antimony tartrate. 17 injections, 0·64 in all over a period of seven weeks. Result: No fever for one month. Spleen just palpable, smear and

culture negative. Weight increased another 12 lb.; white cells, 7500 per c.mm.

About this time Major Mackie sent me the notes of another case of kala-azar that he had attempted to treat with a sample of stibenyl that had been sent to him. I did not see this case myself. I give a few notes that Major Mackie was good enough to supply by letter.

CASE 8.—Male aged 12 years. L.-D. bodies present in the spleen puncture smear. Treatment as follows: August 15th, 1921, 0·1 g. stibenyl; no ill-effects. 17th, 0·13 g.; violent vomiting, purging, abdominal pains and giddiness commencing five hours after. 19th, 0·1 g., and 21st, 0·13 g.; no ill-effects. 23rd, 0·16 g.; more severe symptoms than after second dose, lasting 24 hours. Eventually prolapse of rectum. Symptoms commenced 15 minutes after injection. Recovery next day. This treatment was discontinued. The boy did well on sodium antimony tartrate.

Although these results were not too encouraging, I still felt that perhaps the drug had not been given a fair trial, and that if used in comparatively small doses it might still be possible to get a full course of treatment into a patient in shorter time than was possible if the simpler salts were used. I therefore obtained two more "sets" of stibenyl, and commenced to treat two more patients with it.

CASE 9.—Indian male aged 22. He was in hospital undergoing treatment for ankylostomiasis, and was accidentally found to have kala-azar by the routine performance of the "aldehyde test." The diagnosis was confirmed by spleen puncture. He gave a vague history of fever, which reacted to quinine, and also of dysentery. Thin, anæmic, spleen 5 in., liver 2½ in. below costal margin. No fever was at first obvious, but by making a two-hourly chart it was found to rise to 99° F. daily. Blood: Red cells, 3,400,000; white cells, 3270; polymorph., 1500 per c.mm. Treatment as follows: Stibenyl, 1·885 g., in nine injections, over a period of 29 days. Result: General condition seemed to be improved, but it must be remembered that he had just completed treatment for ankylostomiasis. The fever, which was almost normal before, frequently rose to 102°. The spleen was reduced an inch in size, and his weight had increased 8 lb. during his stay in hospital (seven weeks). Blood: White cells, 4370; polymorph., 1573 per c.mm. Spleen puncture: Large numbers of L.-D. bodies still present. The patient refused to stay in hospital for further treatment.

CASE 10.—Indian boy aged 13. Weight 58 lb. Fever for 4½ months. Weak, emaciated, anæmic. Cardiac dullness slightly increased, a systolic murmur at apex. Spleen 6 in., liver 2½ in. below the costal margin. Irregular fever up to 103° F. Blood: Red cells, 2,000,000; white cells, 3125; polymorph., 1375 per c.mm. Spleen puncture: Numerous L.D. bodies. Urine: Trace of albumin, no casts. Treatment as follows: Stibenyl, 1·58 g., in nine injections, over a period of 34 days, commencing with 0·035, and increasing to 0·32 g. The patient had no toxic symptoms, except occasionally pains in the epigastrium after the injections. The day after the last injection the temperature which had remained unaltered by treatment rose a little higher than usual to 103·5°, and the patient had severe pain in the epigastrium. He passed a little blood in his stool, his pulse gradually became weaker, and he died on the following morning, 40 hours after the last injection. Before his death his weight had increased 2½ lb., and his spleen had decreased by 1 in.

Post mortem: Heart dilated and flabby; no valvular lesions. Liver, fatty degeneration. Spleen large, congested, with little fibrotic change. Peritoneum had the appearance of tuberculous peritonitis (but no T.B. were found). There was a deep ulcer in the transverse colon from which there had been some hæmorrhage, but there was only a little changed blood in the large intestine. Smears from the spleen showed large number of L.-D. bodies and a growth of flagellates was obtained. Kidneys, no macroscopic change.

The results of the treatment of these two last cases I look upon as disastrous. Not only did one of the patients die in circumstances which are most unusual in a case of kala-azar, but both this patient and the other one had had an amount of stibenyl the antimony content of which was quite equal to the antimony content of the amount of the sodium or potassium tartrate salt which is considered a curative dose, and yet they were not only not cured but seemed to show the infection absolutely undiminished. The course that the disease runs is usually comparatively chronic, and the damage extensive and widespread, so that it would be absurd to expect damage which had been caused in six months to be repaired in one month, but at the same time one does expect to see the cause of the damage removed.

General Consideration of Results.

The result of the treatment, or rather attempt at treatment, of these 10 cases is not very encouraging to those who are seeking a short cut to the treatment of kala-azar. I have not tested the toxicity of the compound very thoroughly, but my experience has been that the minimum lethal dose when given intramuscularly is in the region of 150 mg. per kg., and, as I have already mentioned, Trevan found the minimum lethal dose of sodium acetyl-para-aminophenyl stibiate to be 133 mg. per kg., and that of sodium acetyl-meta-aminophenyl stibiate to be 174 per kg. given intravenously. None of the patients weighed less than 25 kg., so that no single dose that we gave was one-tenth of the minimum lethal dose (in rats). Even allowing for the debilitated condition of the patient, we were well within the margin of safety. Or, comparing it with the potassium salt, the toxicity of this is about eight times that of stibenyl, and I should have unhesitatingly given 100 mg. of the former to any of these patients. To account for this apparent discrepancy between the theoretical toxicity and the actual results in practice there are various possibilities:—

(*a*) The plasmolytic effect may be very marked, and the sudden release of protein poisons may prove too much for the patient. The symptoms in some cases were not unlike those of protein shock, but, on the other hand, there has been little in my experience to suggest that stibenyl has much plasmolytic effect.

(*b*) The cumulative effect is probably more when a compound with a large molecule is used, and some unknown factor may cause the sudden setting free of this accumulation of antimony.

(*c*) The compound may not be very stable, and may have undergone some change on its journey out to India.

Some facts were noticeable which fit in respectively with the theories just put forward. The interval between the giving of the injections and the onset of the toxic symptoms tended to decrease in each individual case; the patients acquired no tolerance to the drug, but, on the other hand, an intolerance was noticeable. Each batch of stibenyl acted in its own particular way. Cases 1, 2, 3, 4, 5, and 6 were treated with the first batch, and, with the exception of the two that died, they all had diarrhœa and vomiting, whereas Cases 7, 9, and 10, who were treated with a more recently despatched batch, did not have any symptoms like the above, but were not cured.

The pamphlet packed with each set of stibenyl states that the preparation may be used intramuscularly in children. It may, but it is very painful—much more painful, in my experience, than any of the other salts of antimony given in the same way. I am ashamed to admit that on one occasion I allowed a small amount of the solution that I was giving to leak into the subcutaneous tissues of the arm, and it gave rise to more serious necrosis than I have ever seen occur in any arm after a similar accident with the other antimony salts. Administered intramuscularly it did give rise, not to the formation of an abscess, but to severe pain at the time and a small lump which persisted for a few days. Thus, in this respect it can claim no advantage over the sodium tartrate salt.

Conclusions.

My personal experience of the use of stibenyl has been so limited (nine cases) that it would be absurd to refer to percentages of death, cure, &c., as the percentage of error in dealing with such small figures would be very great. Also I am conscious that the conclusions drawn are subject to the same chance of error, but as I am not likely to have any further experience with this compound I must use that which I have had and risk justifiable criticism.

(1) That the use of stibenyl for the treatment of kala-azar has not been successful in my hands at any rate, or in those of others in India.

(2) That there is some other factor to be taken into consideration than that of the relative toxicity of this organic compound of antimony; and that this probably also applies to other complicated organic compounds of antimony, which should therefore be used with the utmost caution.

(3) That the curative effect of an antimony compound is not in direct proportion to its antimony content.

My thanks are due to Major F. P. Mackie for permitting me to publish the notes on his cases.

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Clinical and Laboratory Notes.

A NOTE ON A CASE OF ENURESIS TREATED BY ELECTRICITY.

BY MARY O'BRIEN BEADON, M.B., B.S. LOND.

(*From the Victoria Hospital, Triplicane, Madras.*)

THE following case shows well the excellent result which may be hoped for from electrical treatment in sphincter deficiency.

A Mahomedan girl, of about 14 years of age, was admitted to hospital on April 3rd, 1922, with incontinence of urine. The mother brought the girl up for treatment as she was always wetting herself, having done so from infancy, and there was now no prospect of her outgrowing the habit spontaneously, and her matrimonial outlook was greatly interfered with if she could not be ridded of her unpleasant condition. The typical smell of constantly dribbling urine pervaded the girl.

Condition on Examination.—We expected at first to find ectopia vesicæ, but there was no abnormality of the abdomen, but the region of the pubes was flattened, and looked almost as if the symphysis pubes were absent—i.e., as if it were a case of split pelvis. However, on rectal examination the pelvis was found normal. On inspection the clitoris was found to be absent, and the urethra was further forward than normal. The urine ran away in an almost continuous stream during examination, and there was obviously complete absence of sphincter control. The question to be decided was whether the sphincter itself was absent or whether, being present, it had never properly carried out its function. The vulva and thighs were slightly excoriated as in a case of vesico-vaginal fistula, showing that the girl suffered from habitual incontinence, and that the condition was not due to temporary paralysis, possibly due to fright.

Treatment.—Galvanic treatment was started immediately. A thin copper electrode was passed into the urethra, and the indifferent electrode was placed on the abdomen, and a current of 5 milliampères was passed for five minutes. The girl was at first much frightened of the battery, but settled down after a few days, and then she was treated with 6 to 10 milliampères for 10 minutes daily. This treatment was persisted in steadily, though at first no improvement was observed. After about 12 days' treatment a slight degree of control was established, which gradually increased. The patient had galvanic treatment for 29 consecutive days; at the end of this time there was very marked improvement, and the patient could hold her urine for a short time during the day. The galvanic current was then given on alternate days for six more treatments. She could then hold urine for three to four hours in the day, and would pass 6 to 7 oz. at a time. At night, however, she still wetted herself, so she was waked every two hours to pass water at night, and thyroid extract, gr. i. t.i.d., was given. The electrical treatment was discontinued after May 12th, and she was encouraged to hold her urine a little longer each day, till by the 23rd she could retain 10 oz. urine in the day, and no longer passed it involuntarily at night. On the 24th she was roused at night, but said she did not need to pass water, and for the first time she passed a night without wetting herself. She was discharged cured on the 29th, after nine weeks in hospital; she had been practically well for one week before discharge.

I had never had a similar case in a young person before, but I gave electrical treatment as in the above case to a woman suffering from incontinence after childbirth, the condition being apparently due to bruising of the sphincter during parturition. She recovered after about eight treatments. In applying the current reversal must be made for one to two minutes before withdrawing the electrode to avoid injury to the urethral mucosa by electrolytic action. In Lewis Jones's "Medical Electricity" it is stated: "The currents used must be decidedly painful, in order to produce a suitable impression on the nerve centres." I think it is much wiser when first treating the patient to avoid causing pain; this may involve a little longer course of treatment, but if the patient's confidence is gained at the outset, and she is not hurt, she will stand the treatment being prolonged. In inserting the electrode care must be taken not to pass it more than from three-quarters of an inch to an inch, otherwise little current will pass to the walls of the urethra. Lewis Jones considers that the best results are obtainable with the induction coil, but in my two cases only a galvanic battery was procurable, and the result in each case was good.

HERPES AND VARICELLA.

BY JOHN F. MCCLEAN, M.R.C.S. ENG.,
RESIDENT MEDICAL OFFICER, LONDON FEVER HOSPITAL, N.

IN view of recent discussion on the identity or otherwise of these two diseases this case is of interest.

A male, aged 46, was sent to the London Fever Hospital on Dec. 13th as a case of facial erysipelas. On admission he was found to have a well-marked attack of left fronto-nasal herpes, which, according to his own history, had commenced on the 5th, and subsequently become infected. There was a definite area of erysipelatous inflammation surrounding the patch of herpes and involving the left eyelid, which was very swollen. This area of inflammation continued to spread and subsequently involved the right eyelid also. Scattered over the trunk were a considerable number of vesicles, some containing clear fluid. A few more vesicles formed after admission, all eventually drying up with scab formation.

On the 23rd—i.e., 18 days after the commencement of the patient's illness—his wife wrote to inform him that their three children had that day developed "chicken-pox" and that the medical officer of health was visiting them in view of the prevalence of variola. Patient made a good recovery, but with considerable scarring over the herpetic area.

The point of interest in this case is the existence of herpes and varicella at the same time. I am indebted to Dr. C. R. Box, senior physician to the hospital, for permission to publish these notes.

A CASE OF "SUBPLEURAL" LIPOMA IN A CHILD.

BY C. F. BEYERS, M.B., B.S. LOND., F.R.C.S. ENG.,
SURGICAL REGISTRAR, JOHANNESBURG HOSPITAL.

THE occurrence of a lipoma arising in the anterior mediastinum of a child is so rare that the following case seems worth recording.

A European boy, aged 22 months, had a swelling on the front of his chest, first noticed by his mother when he was 10 months old. It was painless and caused no symptoms, but grew steadily larger. On examination the child appeared to be rather pale, but was sturdily built and otherwise quite healthy. To the left of the sternum, and overlying the fifth, sixth, and seventh costal cartilages was a soft, clearly defined swelling, measuring roughly 2 inches. in all directions. Its surface was somewhat lobulated, and it gave a feeling of fluctuation. It had no connexion with the skin, but was firmly fixed to the subjacent tissues. I made a diagnosis of cold abscess arising from a tuberculous rib.

Operation.—I made an incision parallel with the sixth rib and cartilage and found a fatty pedunculated mass, the pedicle of which appeared to pass through the sixth interchondral space into the thoracic cavity. I removed the sixth and seventh cartilages, which appeared normal, and traced the pedicle to a second fatty mass, slightly smaller than the extra-thoracic portion. It occupied the anterior mediastinum, pushing the pleuræ away from each other and resting on the pericardium. It was clearly circumscribed,

lying quite loose in the areolar tissue and having no obvious organic connexion with either pleura or pericardium. In removing the tumour, which shelled out quite easily, I had to tie two fair-sized arteries which ran down vertically on each side of the isthmus; these were probably the terminal branches of the internal mammary artery. The skin wound was closed and the patient made an uneventful recovery. The pathological report on the specimen stated that it was a fatty tumour.

The points of interest in this case are: (1) The very youthful age of the patient; (2) the dumb-bell or collar-stud shape of the tumour; (3) its origin and site. It is difficult to say definitely from what structure the lipoma arose. It may equally well have originated in the extra-pleural or extra-pericardial fat, or in the loose areolar tissue which fills the anterior mediastinum, or even from the connective tissue between the slips of the triangularis sterni muscle. Bland-Sutton uses the expression "subpleural" and refers to a similar case described by C. Gussenbauer, where the extra-thoracic portion of the tumour appeared underneath the pectoralis major and simulated a sarcoma. Ewing in "Neoplastic Diseases" mentions similar cases described by Cruveilhier and Conner, together with a case of Czerny where the tumour appeared externally in the back. How can a soft tumour such as a lipoma penetrate the chest wall through an extremely narrow interchondral space, guarded by slips of triangularis sterni muscle and occupied by intercostal muscle and membrane? Possibly the increase in size and vigour of the heart may have assisted in its extrusion, though one would expect that it would take a line of lesser resistance and grow laterally, prolapsing into one or other pleural sac—a circumstance which does occur, according to Rokitansky (see Bland-Sutton's "Tumours, Innocent and Malignant").

ACUTE OSTEOMYELITIS TREATED BY EARLY INCISION; RECOVERY.

BY P. B. KITTEL, B.CH. CAMB., M.R.C.S. ENG.,
SENIOR HOUSE SURGEON, METROPOLITAN HOSPITAL, LONDON, E.

THE following is an account of early incision performed in a case of acute osteomyelitis, near its onset.

On August 8th, 1922, the patient, a male aged 8, was brought to this hospital complaining of headache and inability to walk from pain in his left leg. He stated that on the previous evening he had experienced pain in his left thigh, felt ill, and vomited. Unable to sleep during the night, he was brought to hospital the next day. There was no history of injury to the left leg.

Condition on Admission.—The patient appeared to be in pain, was flushed, and held his left leg flexed slightly. His left thigh was exquisitely tender to pressure on the bone about its middle. It measured 1½ in. greater in circumference than the right thigh. The tibia on the left side was not tender, but there was slight œdema over the lowest third. Temperature 103·8° F., pulse 136. There were no signs of inflammatory disease in any other part of the body.

Operation.—The condition was diagnosed as acute osteomyelitis, and it was decided to incise the periosteum of the left femur forthwith. The operation was performed under a general anæsthetic. The periosteum was exposed over a length of about 2 in. on the lateral side of the limb at the level of the highest third through a skin incision about 4½ in. long. The periosteum was incised, and separated from the bone for about ½ in. each side of this incision with a periosteal elevator. There was no collection of any sort found outside or under the periosteum. The bone appeared congested. A rubber tube was inserted through the incision to the bone, the skin was closed with fishing gut sutures. Two hours after the operation the temperature fell to 99° and the pulse to 108. The patient was asleep and in a perspiration. The next day the temperature was 102° and the pulse was 98. For the next two weeks the temperature ranged from 98·4° to 99° and the pulse slowly fell. The tube was removed on the second day and the stitches on the tenth day. The wound healed by first intention.

The boy left the hospital in good health at the end of one month from the time of admission.

I am indebted to Mr. H. Curtis for permission to publish this case.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ANÆSTHETICS.

CARDIO-VASCULAR CONDITIONS IN RELATION TO ANÆSTHESIA.

AT a meeting of this section of the Royal Society of Medicine on Feb. 2nd this subject was fully debated. The chair was occupied by the section President, DR. A. L. FLEMMING (Bristol).

DR. J. STRICKLAND GOODALL introduced the subject from the standpoint of a preliminary examination of the patient in a systematic manner. When this had been done and the result imparted to the anæsthetist, the latter was the person best able to decide as to what was the best anæsthetic for that particular case. He had often been impressed by the casual way in which, in an operation case, the anæsthesia side was regarded. In some instances great care was taken over the choice of a surgeon, but almost any anæsthetist was considered good enough. And sometimes a physician gave an opinion as to whether a case was suitable for an anæsthetic to be administered without knowing or inquiring what was the nature or the probable duration of the proposed operation. In setting out the scheme of examination of cardio-vascular cases he was aware that in some there could only be a superficial examination owing to the condition of the patient. The object of the examination was to minimise the operative risk. He thought that before long every general hospital in London would have a properly equipped cardiological department, run by properly trained specialists, who would examine every case intended for operation, instead of by inadequately trained assistant physicians. The examination of the cardio-vascular system could be considered under the following three heads: (1) examination of the heart; (2) of the vaso-motor and vascular systems; (3) of the respiratory pump. And it was advisable, wherever possible, to examine with the patient standing, prone, and half reclining. Inspection at once revealed the typical mitral face, the pale face of aortic disease, the pale yellowish face of infective endocarditis, and the very pallid face of pericarditis. If there was cyanosis one examined the jugulars and looked for clubbing of fingers, inspected the carotids, felt for the liver and spleen, and looked for œdema of legs. Also attention would be directed to the apex beat; was it diffuse or heaving? It was often possible to detect at once, before the patient entered the operating theatre, whether mitral stenosis, auricular fibrillation, excessive venous engorgement, and an enlarged liver were present.

With regard to palpation, if there were a slapping apex beat it meant that the muscle of the ventricle was not contracting rhythmically. This might be because: 1. The muscle was degenerated; it was one of the first signs of myocardial degeneration. 2. Because it was poisoned. 3. Because it was not sufficiently stretched by adequate filling. A heaving apex beat meant left ventricular hypertrophy. A dual apex beat mostly meant the existence of a double lesion, generally mitral. In addition to examining the liver and the spleen, one should try to ascertain whether there were râles in the lung. Special care should be devoted to the character of the first sound, for it indicated the condition of the muscle and of the auriculo-ventricular valve. The sound was shortened in any condition which interfered with the contractility of the ventricle. He believed that a systolic murmur at the apex always meant a leakage through the mitral valve. An accentuated aortic sound meant a high peripheral resistance and a raised blood pressure. If it were ringing in character it meant damage to the structure of the aortic valve, and usually dilatation of the aorta above it. It did

not mean a high peripheral resistance. The quality of the first sound at the apex gave the best information as to the condition of the myocardium. When the latter was in question, the electro-cardiograph should always be used. Exercise was one of the most reliable methods of assessing the condition of the myocardium. When the normal heart was exercised it gradually sped up, the blood pressure rose, respirations increased in frequency, then there was a return to normal. Some hearts were unduly accelerated by exercise and the return to normal was very tardy. In a third type there was impaired acceleration on exercise, and heart-block and flutter ensued. A fourth type, met with only in athletes, was that in which exercise doubled the rate. Exercise might also vary the rhythm, and if irregularity of the heart beat ensued, it was due either to extra-systoles (indicating fatigue) or auricular fibrillation (damage to auricular muscle) or alternation. Exercise might also alter the normal heart sounds.

In aortic regurgitation the diastolic murmur should be examined for over the aortic base, over the mid-sternal line, and to the pulmonary side. The cases with the worst hearts, from the anæsthetic standpoint, were those having profound myocardial toxæmia; those with marked hyper-irritability; those having a definite degeneration of myocardium; and those in which that structure was acutely inflamed. In aortic cases the vaso-motor mechanism must also be carefully investigated. In aortic regurgitation the systolic blood pressure was high, and the diastolic low; also, the pressure in the arm was higher than that in the leg, the difference in the two being supposed to indicate the vaso-motor tone.

Though he had for some years been examining about 300 heart cases per week, including many thyroid cases, he had not been consulted in regard to an anæsthetic in 2 per cent. of his cases. In thyroid cases the two chief kinds of heart were the pneumo-mechanical and the toxic heart met with in Graves's disease. He had found that in the thyroid cases submitted to operation the blood pressure rose after the operation; also that in typical Graves's disease the blood pressure passed through three phases: an initial rise, followed by a 10 per cent. to 20 per cent. drop, then a further rise. If operation were done after the first rise, the blood pressure rose, and this was the stage at which the patient was in trouble or difficulty. In this disease the heart underwent a progressive degeneration; tachycardia occurred first, resulting in some myocardial fatigue, followed by atonia and leaking of different valves, and later pericardial friction rubs, and toxic myocarditis. The cause of death in these cases was, he considered, ventricular fibrillation, showing myocardial damage. It was fairly safe to operate on cases of Graves's disease if the ventricular myocardium was sound and the blood pressure was not very high at first. For these the best general anæsthetic was open ether; the worst, chloroform. In the pneumo-mechanical heart the myocardium was not degenerated, therefore operation was safe.

Sir BERNARD SPILSBURY said that in the summer of 1913 he analysed all the fatalities which at that time he had investigated—namely, 104 cases—in which death occurred either during the administration of the anæsthetic, or within a very short time of it. These did not include cases of delayed chloroform poisoning. In the cases of the kind since 1913 he could point to two differences. The 104 cases to 1913 were those in which he made the post-mortem examination himself; and they represented at least 100,000 administrations. In 58 of the 104 chloroform alone had been employed; chloroform mixed with ether, or A.C.E. in another 22, the two aggregating almost 80 per cent. of the fatal cases. Of pure ether there were only 12 cases, and stovaine only one case in that series. He divided the fatalities into two groups: The first consisted of a small class, 32 in number, in which death was associated with status lymphaticus. One-fourth of these occurred in the first five years of life. The changes characteristic of lymphatism he had fully corroborated since—viz., the presence of a functional thymus gland, or of some thymus tissue overgrowth in the lymphoid apparatus. A less constant change which he found in the cases of status lymphaticus was either fatty degeneration or brown atrophy of the heart muscle. Recently he had classified the degeneration of heart muscle into two kinds; the diffuse, fine type, never very advanced, but much more uniform. This was the condition so frequently present in status lymphaticus. The other kind was more gross and patchy.

The second great group were the deaths which occurred in connexion with malignant growths generally. Cases of Graves's disease presented a very important group, also such other desperate conditions as acute peritonitis and intestinal obstruction. The status lymphaticus cases did not exceed 33 per cent. of the total; in a larger proportion there was either fatty degeneration or brown atrophy. In many cases there was present a grave bodily condition which endangered life, quite apart from the administration of the anæsthetic, so that the latter played only a minor part in the fatal issue. In the last nine years he had investigated 174 fatalities, and analysis showed a definite drop (i.e., to one-half) in the proportion of status lymphaticus cases—i.e., only 26 of the 174. One-third of the cases were in the first five years of life. In this later series there was a larger proportion of cases in which the anæsthetic probably had no direct part in the death; he referred to such conditions as pulmonary embolism, air embolism, very serious uterine hæmorrhage, the opening of an aneurysm, &c. There were also many cases in which the patient was moribund when brought; in these latter stovaine had been given in 12. This was employed because the patients were desperately ill, and it was considered the safest of the anæsthetics. In the 174 cases, pure chloroform was given in 56, chloroform with some other substance in 56, ether alone in 36, stovaine alone in 9, and nitrous oxide in 17. The administration of chloroform had greatly diminished recently, and that of ether was much increased. Chloroform Sir Bernard Spilsbury considered a most dangerous anæsthetic in cases having myocardial degeneration. In this second series of 174 cases he had systematically examined the heart muscle, and in nearly all he found either fatty degeneration or brown atrophy, or a combination of the two. He spoke of four deaths in the series due to anæsthetics taken for the purpose of murder or suicide, in all of which except that of a boy aged 11, one of the conditions of heart muscle referred to was found. Only a small proportion of the 174 cases showed advanced valvular disease.

Dr. GOODMAN LEVY agreed that subjects of valvular disease took the anæsthetic well, especially chloroform. Ventricular fibrillation was less likely to occur when the general blood pressure was low. When syncope occurred in a person with fatty heart, it did not necessarily follow it was because of the fatty degeneration. Great care should be exercised in cases of heart-block—i.e., a complete dissociation of the auricular from the ventricular beat; chloroform might so accentuate this condition as to lead to collapse. Subjects of Graves's disease were liable to die suddenly without an anæsthetic.

The PRESIDENT said a matter on which the anæsthetist required help was when a patient went to a heart specialist who told her she perhaps had aortic regurgitation and that an operation could be safely submitted to provided the anæsthetic was stovaine; or as she had exophthalmic goitre the anæsthetic must be pure chloroform. This opinion should not be given to the patient, but to the anæsthetist.

Dr. JOHN PARKINSON said the profession was greatly in need of a rapid heart stimulant: strychnine, camphor, ether, alcohol, caffein had very little action on the heart. He urged the necessity of submitting patients suffering from auricular fibrillation to a few days' preparation before the operation; this would greatly diminish the operation risk.

Mr. JAMES BERRY said he operated largely on a class of case—thyroid cases— which had exceptionally bad hearts, and he was indebted to Dr. Strickland Goodall for much valuable help. The report of the electro-cardiographist was of very great value to the operating surgeon. There should certainly be a closer coöperation between cardiologist, surgeon, and anæsthetist. Each case must be judged on its own merits. Two classes of case always gave him anxiety, the fat, flabby person, and the patient with advanced malignant disease, especially if the glands were cancerous.

ROYAL MEDICO-CHIRURGICAL SOCIETY OF GLASGOW.

A MEETING of this Society was held on Feb. 2nd, when an address on Some Recent Work on Colour Blindness was given by Mr. R. A. HOUSTON, D.Sc., lecturer on physical optics in the University of Glasgow. In the course of his address Dr. Houston said that during the past eight years statistical surveys of the colour vision of more than 2000 students have been made at Glasgow University. They have already been described in papers in the Proceedings of the Royal Societies of London and Edinburgh and in the *Philosophical Magazine*, and the present lecture dealt with some of the principal results obtained. Frequency curves were shown representing the variation of the ability to discriminate colour about a mean. These demonstrated that normal variation covers almost everything as regards women, but not as regards men. The colour blind could not be regarded as an extreme case of normal variation. Trichromasy passed into monochromasy directly and not through dichromasy as an intermediate stage, as the original form of the Young-Helmholtz theory required, and the results of the investigation rendered untenable the latter theory and also the Hering theory. The final theory when it came would be a photochemical one, and the prospects of advance were at present hopeful.

CARDIFF MEDICAL SOCIETY.

A MEETING of this Society was held on Jan. 16th, Prof. EWEN J. MACLEAN, the President, being in the chair.

Dr. H. A. HAIG gave a lantern demonstration of the cytology of tumours, illustrated, in addition, by numerous sections. The points of the differential diagnosis of benign, borderland, and malignant growths were presented. He further showed examples illustrating the presence of nucleolar fragments in the cytoplasm of mitosing cells in malignant tumours, a phenomenon confined to cancerous and sarcomatous growths.

Dr. J. W. TUDOR THOMAS described a case of

Endothelioma of the Orbit

in a young woman of 27, who said that something had been wrong with the right eye since childhood, and that during the last two years the eye had become pushed forward. She complained of diplopia and occasional pain in the eye. On examination there was found to be about half an inch of proptosis of the right eye, and displacement downwards considerably below the level of the other eye. There was no paralysis of muscles, but movement of the eye upwards was restricted. Under the upper lid was felt a hard mass, somewhat nodular and tender, and firmly fixed to the roof of the orbit. It protruded slightly beyond the upper orbital margin. The fundus was normal. A diagnosis was made of orbital tumour, probably a fibro-sarcoma. Seven months ago the tumour was removed through an incision in the line of the eyebrow. It was firmly attached to the roof of the orbit, and appeared to be growing from the orbital periosteum, and it extended well behind the eye. The tumour was about the size and shape of a small pigeon's egg, and on microscopic examination was diagnosed as an endothelioma. The patient now had no diplopia, the eye gave her no trouble; it had returned to its normal place in the orbit, and was practically similar in appearance to the other eye.

Mr. D. J. HARRIES read a paper on the

Influence of Intestinal Bacteria upon the Thyroid Gland.

He drew attention to the discovery that thyroxin was a derivative of tryptophan, an amino-acid normally produced in the intestine during digestion of proteins. The normal flora of the human intestine could be divided into two main groups: (1) fermentative, (2) putrefactive. In lower animals it was possible to destroy the putrefactive group by administering carbohydrates, especially lactose and dextrin, but unfortunately this was not possible in a healthy human being. In a series of experiments on guinea-pigs A. Distaso and Harries had shown that the presence of indican in the urine depended on the presence of putrefactive organisms in the intestine, and that the disappearance of the latter coincided with the disappearance, not only of the indican, but of all the organic sulphates from the urine. This was important, as it explained the sympathetic symptoms in exophthalmic goitre. In another series of experiments the speaker had shown that in exophthalmic goitre the indican and other organic sulphates in the urine diminished as the symptoms increased, and that they ultimately disappeared in serious cases, and only reappeared during recovery from the disease. In ordinary parenchymatous goitre there was no diminution, but often an excess of indican and all organic sulphates. In these cases any diminution in the indican suggested the onset of exophthalmic symptoms. Parry Morgan's recent work on patients agreed with the results obtained by Distaso in lower animals. He found very few colonies of putrefactive organisms on media inoculated with fæces from exophthalmic goitre cases. Partial thyroidectomy in exophthalmic goitre reduced the symptoms by diminishing the size of the gland, and therefore its capacity for manufacturing thyroxin from the tryptophan absorbed; and that the amount of tryptophan absorbed depended, naturally, on the food taken and on the amount converted into indol and skatol by the putrefactive organisms in the intestine. Therefore diet was important. The prognostic value of the urine examination for indican was also emphasised, as its absence in early cases of exophthalmic goitre was of grave significance. The methods for re-establishing a putrefactive flora in exophthalmic goitre were dealt with, and the suggestion was put forward that the difficulties encountered might be due to a temporary immunity against the particular group required. The following general conclusions were drawn:—

1. Exophthalmic goitre is due to the excessive absorption of tryptophan from the intestine; this in turn is traceable to the absence of the indol producers from the intestine.
2. The absence of indican from the urine indicates the absence of indol producers from the intestine.
3. In exophthalmic goitre the early disappearance of indican from the urine is of serious prognostic importance.
4. Operative treatment has a definite place in the treatment of exophthalmic goitre. Medically, much can be done by suitable dietetic measures.
5. Diffuse parenchymatous goitre is characterised by an excess of indican in the urine, suggesting an excessive destruction of tryptophan. If this excess gives place to a diminution or complete disappearance of indican, that suggests that the case is assuming the exophthalmic form.
6. Myxœdema is due to atrophic changes in the thyroid gland, which loses its capacity for dealing with the circulating tryptophan, whether that substance be excessive, deficient, or normal in amount. The disease is thus compatible with the presence or absence of urinary indican.

Dr. PRICHARD mentioned a case of exophthalmic goitre which improved very much after an attack of acute rheumatism.

The PRESIDENT mentioned the possible connexion between eclampsia and intestinal bacteria, and drew attention to the good results obtained by intestinal lavage.

Dr. PARRY MORGAN mentioned the feasibility of influencing the flora by administering the required organisms in keratin capsules by the mouth.

Mr. HARRIES, in reply, stated that Dr. Prichard had opened up the subject of the interaction of various groups of organisms the one on the other. In all probability the infection in his case had interfered with the dominance of the fermentative group, allowing the putrefactive to be re-established. Colonic lavage in eclampsia acted in two ways: First, dilution of the toxins by the water absorbed; secondly, removal of large numbers of organisms from the large and lower part of the small intestine. Dr. Parry Morgan's suggestion had already been considered and was going to be adopted. In conclusion, Mr. Harries stated that the action of one ductless gland on the others had been much overestimated. When it was realised that the putrefactive group of organisms controlled not only the supply of tryptophan to the thyroid, but also the supply of thyroxin (from which adrenalin is probably produced) to the suprarenal, it was unnecessary to assume any interaction in exophthalmic goitre. He had avoided discussing any of the other ductless glands as he wished to keep as far as possible to the gland under discussion—viz., the thyroid.

Reviews and Notices of Books.

PREVENTIVE MEDICINE.

An Introduction to the Practice of Preventive Medicine. By J. G. FITZGERALD, M.D., Professor of Hygiene and Preventive Medicine and Director of the Connaught Antitoxin Laboratories of the University of Toronto. Assisted by P. GILLESPIE, M.Sc., and H. M. LANCASTER, B.Sc. Also Special Chapters by other Contributors. London: Henry Kimpton and Co., Ltd. 1923. Pp. 826. 37*s.* 6*d.*

THIS important new work is the most ambitious Canadian text-book hitherto issued on the subject of preventive medicine and gives high promise of future achievements. The subjects dealt with are those usually included in manuals of hygiene and public health, with a few omissions such as climate and soil; an unusually large space is given to the prevention of communicable diseases. What may be described as the non-medical chapters are concerned with water, milk, and foods (by Mr. H. Lancaster), with a section on domestic and community sanitation by Mr. P. Gillespie, and one on air and ventilation by Mr. Lancaster. The 48 pages on water deal with many aspects of this subject. There is, however, little or no information on the epidemiological aspects of water-supplies, and bacteriological examination is scarcely stressed adequately as compared with chemical examination. From this point of view Mr. Lancaster's chapter on milk is more satisfactory. The practice as to preservatives in milk is closely similar to that in this country, all preservatives being prohibited except boric acid in cream, the presence of which must be declared, and not in excess of 1 part in 400. Apparently the English distinction between dairy cream and grocer's cream is not made. In Ontario there appears to be only one grade of certified milk, which, among other requirements, must be milk derived from cows who fail to react to the tuberculin test to which they are submitted every six months. It is stated that "extensive observations on infants fed on pasteurised milk show that there is a possibility of scurvy developing in some cases." This is scarcely in accordance with European experience and one would like to examine the evidence. But the warning is useful as emphasising the possible risk of renewed domestic boiling of pasteurised milk.

The chapter on diet by Dr. A. Hunter gives a fairly complete summary of our knowledge of this subject. Reference is made to the demonstrated potency of the therapeutic administration of sodium iodide in limiting the prevalence of goitre among school-children in the Great Lake Basin of North America, an observation too little known in this country. We note that recent observations showing the importance of sunlight as well as of cod-liver oil in the prevention of rickets are not included in the review of this subject. To domestic and community sanitation 76 pages are devoted. This section is well illustrated, and contains much useful information; but we should have preferred to exchange much of it for fuller information on the agencies more closely associated with preventive medicine. The time when the health officer can hope to be also a sanitary engineer has passed; and he must perforce be content to understand thoroughly the principles of structural sanitation, leaving the details of construction to his engineering colleague. In the chapter on air and ventilation, while due prominence is given to the importance of circulation of air, it is pointed out that, though air circulation in circumstances of crowding greatly increases comfort, it tends to promote the dissemination of disease-producing bacteria ejected by sneezing and coughing. When such possibilities of infection exist, fans increase the risks of overcrowding.

The special medical part of the book occupies over 300 pages, wherein the chief communicable diseases and the means for preventing them are well discussed. The chapter on tuberculosis is perhaps the least satisfactory. The long extract from the report of a board of consultants in Canada on tuberculosis in the Canadian expeditionary forces in the war shows only that the official figures and the comparisons with figures for American and British troops are untrustworthy. The statistics given in this and in other diagrams are not well selected, and some of them are redundant. On p. 199 a table is given from McVail showing the reduction in the deaths from small-pox in England during a series of years. Unfortunately this is described as a reduction in the "fatality" of small-pox, this word in epidemiological literature being usually restricted to mean "case-mortality." In the small-pox chapter there is an interesting contrast between the view associated with the name of Dr. C. K. Millard and the older teaching that vaccination should be universally enforced. It is agreed that vaccination protects the individual against small-pox, but in the older communities it cannot in practice be enforced without consent, and the vaccination of contacts and collateral measures have succeeded in limiting local outbreaks so far. On the other hand, Dr. Heiser's experience is quoted as showing that in the Philippines general vaccination has almost eliminated small-pox. In communities of relatively low civilisation it would appear that universal vaccination is the most effective and most easily arranged safeguard; but in well-organised communities, given complete public health administration, and all that this implies, protection against small-pox may be obtained by prompt emergency vaccination. Although in this volume it is noted that the practice of not undertaking terminal disinfection in diseases like scarlet fever is increasing, the evidence adduced by C. V. Chapin and others in favour of this relaxation is not given, and a large amount of space is devoted to the details of disinfection.

Three most important chapters deal with maternal and infant mortality, school hygiene, and public health clinics. From these chapters the student and medical practitioner will gain a clear idea of the possibilities of preventive medicine, though here again the statistics are not very well selected or arranged. The chapters on vital statistics and on public health organisation cover the usual subjects. There is a useful table on p. 672 giving the health appropriation per capita in a large number of American States and the relative share taken by different branches of public health work. Mention must be made of the admirable first chapter discussing the aims and problems of preventive medicine. While insisting that much already is being done, Dr. Fitzgerald looks to the dawn of the day when the private physician will be engaged to keep his patient well by routine examination, by supervision, and advice. He advocates medical, nursing, and dental supervision of the whole of life, on the lines on which free education

is now provided at the public expense. Many will not take advantage of it, but there should be no excuse for neglect of means for the retention or the restoration of health.

DER KÜNSTLICHE PNEUMOTHORAX.

By LUDWIG VON MURALT. Second edition, with a Supplement: Kritische Erörterung und Weitere Erfahrungen. By Prof. KARL ERNST RANKE. Berlin. Julius Springer. 1922. With 53 illustrations. Pp. 150. 10*s*.

ONLY about two-thirds of this book on artificial pneumothorax are written by the late Ludwig von Muralt. The last third is written by Dr. Ranke, professor of medicine at the University of Munich. In his foreword he gives a short obituary notice of his collaborator. Ludwig von Muralt was infected by tuberculosis when, as a student, he was carrying out a post-mortem examination. Thenceforth his life was a constant battle with tuberculosis. A mathematician of no mean order, he brought to the study of medicine a certain precision and logical reasoning, evidence of which is abundant in the present work. Beautifully illustrated, it gives a comprehensive survey of the subject, from its history to the results achieved.

The author is quite right in giving to Saugman the credit for introducing the manometer into the operation, converting it into a technically efficient and exact procedure. Both the puncture and the open method of Brauer are described. Realising the great dangers and difficulties of the first injection, when the pleural surfaces are in apposition, the author recommends the open method to those physicians who have not mastered the delicate technique of the puncture method. For this class of physician it is better that he inflicts on the patient the discomforts of the open method than that he should cause death by gas embolism. It is admitted, however, that most of the published deaths from gas embolism occurred during refills and not at a first injection. With regard to the comparative importance of gas embolism and pleural reflex as causes of death, the author favours the present general tendency to interpret nearly all the fatalities as sequels to embolism. He does not, however, dismiss pleural reflex as a mere phantom of the imagination. He has obtained good results in 48 of his 70 cases. Prof. Ranke's contribution to this book is of a supplementary and editorial character. One of his most interesting tables shows how greatly different authorities vary with regard to the frequency with which the induction of a pneumothorax was prevented by pleural adhesions. At the one end of the scale, Harms failed to induce a pneumothorax in only 5·9 per cent. At the other end, Saugman failed in 35 per cent. Prof. Ranke calculates that the experience of these two and four other authorities shows that in 27·1 per cent. of all cases it is impossible to induce a pneumothorax.

This book is a valuable addition to the large and rapidly growing literature of artificial pneumothorax.

PSYCHO-ANALYSIS.

Introductory Lectures on Psycho-analysis. By Prof. SIGM. FREUD, M.D., LL.D., Vienna. Authorised English translation by JOAN RIVIERE. With a Preface by ERNEST JONES, M.D. London: George Allen and Unwin. 1922. Pp. 395. 18*s*.

Freud's own work has hitherto appeared in a form which, whilst providing a record of the growth of his theory, was disconnected and gave no general view. His "Psycho-pathology of Every-day Life" and "Interpretation of Dreams" are complete in themselves and will probably become land-marks in the development of a theory that has hitherto survived an opposition as determined as any in the history of science; but the general exposition of psycho-analysis has been in the hands of other writers whose competence was not always equal to the efficient performance of the task. In these lectures, delivered in 1915–17, Freud fills the gap.

In the first part he talks of the psychology of errors, and gently leads up to the idea that they are not accidental and meaningless, but have a meaning which may be detected by the perpetrator, though more often there are mental processes involved of which he is ignorant. Part II. is devoted to dreams: ancient and modern views are sketched, and the author admits that physical stimuli, to which importance has been attached as a sufficient explanation, may be the occasion of the dream, but can no more explain its whole content than the occasion of the writing of *Macbeth* (the accession of James I. explains the whole content of that drama. He lays down the propositions that dreams are a mental process and that a man can possess knowledge without knowing that he does; these he sets out to prove, and he leads up to free association by proposing that to obtain the meaning of the dream we should ask the dreamer. In describing the censorship he defends himself against the charge that psycho-analysts can only see the evil side of human nature: "We dwell upon the evil in human beings with the greater emphasis only because others deny it, thereby making the mental life of mankind not, indeed, better, but incomprehensible" (p. 123). Free association is sharply distinguished from the interpretation of symbols by the analyst. Free association gives the dreamer's interpretation and suffices in many dreams, but there occur "silent" elements where association fails, and the substitution of meanings by the analyst leads to a satisfactory explanation of the whole dream, which would otherwise remain meaningless and disconnected. This is the most disputed part of psycho-analytical theory, especially as the symbols interpreted pertain largely to the sexual life; this symbolism has been described and attacked so often that it is not necessary to give an account of it here. Freud supports it by appeal to recognised symbolism of similar nature in mythology, philology, folk-lore, and religion, but this appeal is not so convincing as the results of free association. The third and last part of the book treats of the neuroses, with their pathology and therapy. If Freud's classification be accepted, apart from his ætiology, it will almost remove from medical literature the word "neurasthenia," which now means so many things that it has nearly lost all meaning. The psychoneuroses comprise conversion hysteria, anxiety-hysteria, and the obsessional neurosis; the actual neuroses are anxiety-neurosis, neurasthenia (the word being used in a narrow sense), and hypochondria, and these, which are the direct somatic result of sexual disturbance, yield nothing towards the study of psycho-analysis. This grouping of the psycho-neuroses accords with clinical experience, though the frequent combination of the anxiety-neurosis with anxiety-hysteria would obscure the distinction between them, even if this distinction were generally accepted.

Freud's well-known views on resistance, infantile sexuality, and the repression of sexual impulses lead to the newer and more difficult theory of the libido and the possibility of its being transformed into anxiety or withdrawn from an object to return to the ego—that is, to the sum of the instincts which are not sexual, and is in conflict with them. Although he speaks of the libido as energy Freud does not fall into the error of supposing that he knows what that energy is, but warns us in this connexion that "The edifice of psycho-analytic doctrine which we have erected is in reality but a superstructure, which will have to be set on its organic foundation at some time or other; but this foundation is still unknown to us" (p. 325). It is to be noted that, contrary to a usual assumption, Freud expressly states (p. 366) that paranoiacs, melancholics, and those suffering from dementia præcox are unaffected by psycho-analytic treatment; even some of his followers may be surprised to read concerning war cases and others: "The traumatic neuroses are not fundamentally the same as those which occur spontaneously, which we investigate analytically and are accustomed to treat; neither

have we been successful so far in correlating them with our views on other subjects; later on I hope to show you where this limitation lies" (p. 232).

Freud's handling of the opposition is on the whole tolerant. He tries to understand the difficulties of those who find his theories repugnant and impossible of acceptance, and recommends the study of one's own personality as a means of obtaining the conviction of the reality of the processes which psycho-analysis describes. In his last chapter he shows resentment, perhaps justifiable, in describing cases which were unfairly used to demonstrate "the unfortunate results of treatment." His marshalling of facts and deductions, the full statement of the arguments of the other side, and the recognition of doubts and of gaps in accounting for the phenomena met with, embody the results of years of hard and earnest work. In view of the intense opposition to his theories, a destructive scientific criticism of this book ought to be forthcoming; no serious critic of psycho-analysis should omit to read it and no serious student can afford to neglect it.

We are told in the preface that an American translation of this book has already appeared but that, owing to its defects, it was decided to do the work anew. Mrs. Riviere has given a smoothly-running version, but her own statement, in a book dealing with the psychology of errors, that the customary sense of "unconscious" is "absence of unawareness" (p. 94, footnote) calls for a full analysis in the next edition.

Remembering and Forgetting. By T. H. PEAR, M.A., B.Sc., Professor of Psychology in the University of Manchester. London: Methuen and Co. 1922. Pp. 242. 7*s.* 6*d.*

THIS book had its origin in a course of lectures to R.A.M.C. officers at the Maghull training centre. Prof. Pear contrasts the earlier investigations into memory, which carefully excluded meaning from the material studied, with the present methods that find memory to depend largely upon emotional values. The psycho-analytical view of the relation of dreams to memories is illustrated by an analysis of a dream of the author, who shows that certain observations raise the question whether we forget anything in the sense that it really passes beyond recall; he discusses the belief that all forgetting is due to repression and leaves open the question. There is little of the abstruse in the book, which forms a good introduction to many of the principles of modern psychology and makes the subject one of human interest.

MISTAKES AND ACCIDENTS OF SURGERY.

By HAROLD BURROWS, C.B.E., M.B., B.S., F.R.C.S., Assistant Surgeon, Royal Hospital, Portsmouth; Hunterian Professor, Royal College of Surgeons. London: Baillière, Tindall and Cox. 1923. Pp. 470. 10*s.* 6*d.*

No power on earth can banish from surgery the accidents dependent upon the frailties of human nature, any more than these can be eliminated from military tactics, engineering or political activities, where an error of judgment may result not in the loss of a single life but in deaths which are counted in scores, or even thousands. It is remarkable how few accidents or mistakes occur in surgery, especially in the surgery performed in hospitals to which a medical school is attached, though the surgeon frequently operates under conditions of stress, suggestion, and fatigue, which are conducive to inaccuracy in mental and physical processes. In these large hospitals the undergraduate student is a most critical onlooker and is not reticent over his opinions, so that a mistake can scarcely occur without the whole staff hearing about it. These incidents are rare.

The author of this book appears to be excessively conscientious in attributing to surgery certain accidents which have only the remotest possible connexion with the art, such as fracture of the skull from falling off the operating table after a tonsillotomy, or the removal of the wrong leg. Other mistakes he relates are almost inconceivable in their stupidity or clumsiness. All one can say about such performances as the division of the body of the penis instead of the cord in a varicocele operation; the removal of piles without making a digital rectal examination, a malignant growth being present; the performance of a colostomy in a collapsed colon for obstruction in the small gut; the suture of the lower ileum to the stomach in gastro-jejunostomy; the enema incident on p. 89, and the remarks of the surgeon who mistook the iliac artery for the appendix—all that it is possible to say is that the operators were untrained and mentally unfitted for their work.

Against most of the ordinarily possible mistakes mentioned the student is warned in the usual text-books he reads. There is much sound advice scattered through the volume and also some doubtful teaching. So eager is the author to tell of mistakes, that twice (p. 39 and p. 64) he relates rumours of an accident which he has not seen or even been able to verify by conversation with other surgeons or in the literature! Mr. Burrows has an easy, fascinating method of presenting his subject; we cannot help wishing that such powers of expression had been devoted to a subject of less questionable value. One may well ask why a whole book should be devoted to the mistakes and accidents of surgery, and after careful consideration, be still unable to see what useful purpose is served thereby. It is perfectly clear, on a perusal of the volume under consideration, that the author had in view only one very laudable object—to call the attention of the inexperienced or occasional surgeon to the pitfalls of his craft, and to prevent a repetition of the errors which have occurred in the past. Whether his aim will be accomplished, and, on the final count, whether good will result, is a matter of opinion.

BRONCHOSCOPY AND ESOPHAGOSCOPY.

A Manual of Peroral Endoscopy and Laryngeal Surgery. By CHEVALIER JACKSON, M.D., F.A.C.S., Professor of Laryngology, Jefferson Medical College, Philadelphia, &c. London and Philadelphia: W. B. Saunders Company. 1922. Pp. 346. 27*s.* 6*d.*

DIRECT examination of the upper air- and food-passages by means of electrically lighted tubes is one of the most notable examples of the adaptation of modern science to medicine, and has already been the means of saving a large number of lives. Prof. Chevalier Jackson is eminent among the pioneers in this work and, being in charge of a bronchoscopic clinic, has had a remarkable experience in the treatment of patients by these methods. Any work from his pen will therefore be read with grave attention.

The first chapter of the book, which is an abstract of the author's larger work, entitled "Peroral Endoscopy and Laryngeal Surgery," gives a good description of the instruments used; only the endoscopes designed by Prof. Jackson, with distal illumination, are described, and no mention is made of other patterns or of the proximal lighting largely used in Europe. In the second chapter the special anatomy of the parts concerned is discussed, together with a useful series of measurements. The following chapters deal with the technique of the preparation of the patient and of the introduction of instruments. It is noteworthy that general anæsthesia is never used in Prof. Jackson's bronchoscopic clinic, and he maintains that a dyspnœic patient should never be given a general anæsthetic. Children at the clinic receive neither local nor general anæsthesia, nor sedative, for laryngoscopic operations or œsophagoscopy, and the same rule applies to œsophagoscopy in adults; but for laryngeal operations in adults and for bronchoscopy in adults and older children a preliminary injection of morphine and atropine is given. It is pointed out that the œsophagus itself is without sensation, but in œsophagoscopy it is considered safer for the beginner to secure relaxation by ether anæsthesia. Prof. Jackson is highly experienced and is accustomed to work with the aid of a team of four well-trained

assistants; but it is difficult to see how the average laryngologist, who is but an "occasional bronchoscopist," is to extract a foreign body from the bronchus of a frightened child without the aid of any anæsthetic or sedative. Practice on dogs doped with morphine is highly recommended, but the procedure is not possible in this country.

A large part of the book is occupied by an excellent description of the symptoms produced by foreign bodies and of the technique of their removal. The discussion of the diseases of the œsophagus is also excellent; it might, indeed, have been expanded, particularly the description of achalasia, or "diaphragmatic pinchcock stenosis" (to use the author's term), at the expense of the chapters on laryngeal diseases, or tracheotomy, subjects not strictly appropriate to a work on endoscopy. The volume gives the impression of being the rather hasty writing of a busy man; misprints are frequent and include a phrase about "the treatment of radium by cancer," while the author is unduly fond of such clumsily-coined words as "autodrownage." These defects will not prevent it from being of great use to all laryngologists. The illustrations are excellent.

LE CURETTAGE UTÉRIN.

By J. FIOLLE, Professeur à l'École de Médecine de Marseille, Chirurgien des Hôpitaux. Paris: Masson et Cie. 1922. Pp. 128. Fr.8.

IF the very simplicity of the operation of curettage of the uterus had not tended to make it one of the most abused operations in gynæcology, it would hardly have seemed necessary to write even a brochure of some 128 pages on its indications and technique. However, though when carried out in suitable cases it is a most satisfactory procedure, it is by no means free from possible risk and is occasionally uncertain and disappointing in its results. The author has, therefore, done the profession a service in placing before them clearly and succinctly the indications for this operation, its technique, the accidents which may occur, and its results. The conclusions he draws are such as most experienced gynæcologists would agree with, and they would also be in complete accord with the note of warning he utters as to the abuse of this simple and, under suitable conditions, safe procedure.

DIFFERENTIALDIAGNOSE.

By Dr. RICHARD C. CABOT, Professor der klinischen Medizin an der Medizinischen Klinik der Harvard-Universität, Boston. Zweite Auflage nach der 12. Auflage des Originals. Von Dr. H. ZIESCHÉ, Leitender Arzt der Inneren Abteilung des Josef-Krankenhauses zu Breslau. Erster Band. Berlin: Julius Springer. 1922. Pp. 603. 15*s*.

THE appearance of a second German edition of Prof. Cabot's well-known book shows how this interesting method of clinical teaching appeals to European students. As the author said in his original preface: The attempt to make and defend a differential diagnosis brings all one's failings into sharp relief—and, we may add, adds piquancy to a systematic treatise. Dr. Ziesché, who is responsible for an admirable translation, tells us that the first German edition was sold out within six months. In his preface he goes through the list of standard students' text-books of medicine on the continent, pointing out how they differ from Cabot's conception. Using the author's name for that of the book, as students do, he tells us that Matthes, which now takes the place of Leube on special diagnosis, is more of a systematic introduction to clinical examination. Ortner, which brings together a mass of observations based upon remarkable wealth of clinical experience, is used principally as a work of reference. Cabot's work will, Ziesché thinks, lead to clinical thinking among the many young practitioners whose education fell in the difficult years of war and who thus lost their opportunity of prolonged apprenticeship as assistants. Rudolf Schmidt's "Clinic of Gastric and Intestinal Disorders" comes, for one region of the body, nearer to Cabot's method. In preparing the second edition, Ziesché acknowledges his indebtedness to other text-books, especially to French's "Index of Differential Diagnosis." A translation of the remaining volume of Cabot is foreshadowed. While the original will naturally appeal most to English students, we can heartily recommend Ziesché's translation as a means of acquiring facility in reading medical German.

PELVIC NEOPLASMS.

By FRANK WORTHINGTON LYNCH, A.B., M.D., Professor of Gynæcology and Obstetrics, University of California; and ALICE F. MAXWELL, B.S., M.D., Instructor of Gynæcology and Obstetrics, University of California. London and New York: D. Appleton and Co. 1922. Pp. 432. £1 1*s*.

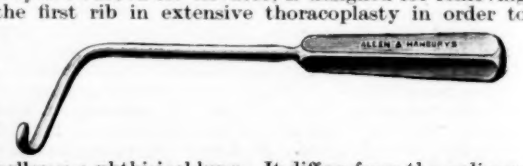
IN this monograph the authors have considered pelvic neoplasms from the historical, histological, and clinical aspects; particular attention has been devoted to the various methods of recognising malignant growth and the results of the most modern methods of treatment—operative, radium, and X rays. Much space is devoted to this question and the conclusions come to are of much value. The authors consider in detail the results in cases of operable carcinoma of the cervix treated with radium, of border-line cases, of inoperable cases, and of those in which there has been a recurrence. In apparently inoperable cases, first treated with radium and then operated upon, the great difficulty often experienced from the fibrous induration resulting is drawn attention to; the experience is almost universal, and for that reason the advice given to operate upon these cases within ten days of the application of the radium should be followed. No doubt the ideal method of dealing with cases of malignant disease at the present day is the preliminary use of radium in all, even early operable cases, the free removal of the growth by the most extensive operation available, and the subsequent treatment of the patient with radium or X rays as a prophylactic measure. More details of the after-results of such cases are, however, required before we can come to definite conclusions on this difficult problem.

The authors have carried out their task thoroughly. They give information about all the varieties of benign and malignant tumours met with in the pelvis, whose value is added to by a good index and a number of excellent illustrations. The series of monographs, of which this particular work is one of the most useful, is a credit to the authors and to the publishers, and will enhance the reputation of the American school of gynæcologists and obstetricians.

New Inventions.

ELEVATOR FOR THE FIRST RIB.

THIS instrument, a modification of the ordinary Doyen's curved rib elevator, is designed for removing the first rib in extensive thoracoplasty in order to



collapse a phthisical lung. It differs from the ordinary Doyen elevator in having the hook-shaped end very short and narrow to correspond with the ribbon-like shape of the first rib. The hook is set at a lateral twist to the shaft and two inches below the line of the shank.

The instrument is made by Messrs. Allen and Hanburys, Limited, Wigmore-street, London, W.

W. H. C. ROMANIS, M.C. Camb., F.R.C.S.

Harley-street, London, W.

THE LANCET.

LONDON: SATURDAY, FEBRUARY 10, 1923.

THE HEALTH INSURANCE CONFERENCE.

THE recent conference of representatives of all the various groups of executive officers, working under the National Insurance Acts, marks an important step forward in the development of the insurance service. It was, as we noted last week, a plenary conference in the sense that for the first time since the first Act came into force in 1911, officials from the approved societies and members of insurance committees have met representative chemists and doctors in free debate. No wonder two days were not found sufficient in which to thrash out the burning questions which agitate the workers; a brief note on some of these appears on p. 301. But it was good for protagonists to meet face to face and to repeat, if they chose, the severe criticisms with which they have been associated in the columns of the daily press. Certain critics, no doubt wisely, did not accept the invitation sent out by the Insurance Acts Committee of the British Medical Association. As each item on the agenda paper was taken in succession it became more and more obvious that the subjects were too big to discuss satisfactorily in a large conference, and it was decided that a small standing committee should be formed to come to real grips with the urgent questions between the professional and administrative sides of the conference. There is material for many meetings of such a committee, and we hope that the magnitude of the task will not deter public-spirited men on both sides from going on until a solution is found to all the difficulties impeding the smooth working of a great national service.

The immediate need is for better mutual understanding. In a recent appeal case at the Ministry of Health the report of the finding of the court contains the dictum: "The practitioner is entitled to expect the patient's coöperation." This gives a clue to the solution of many of the difficulties in insurance work. Coöperation is essential in the proper working of the scheme, and to secure it there must be confidence and goodwill, which are themselves unobtainable without understanding. The ignorance and stupidity of the insured person was referred to on more than one occasion, and he was not there to defend himself. That he is ignorant is not to be wondered at, for he has few means of learning the intricacies of national insurance. His stupidity is the natural outcome of the darkness in which he is left. His agent makes demands upon him which he is unable to comprehend; the most accessible friend is his panel doctor, who often goes far beyond his own sphere in his interest for the welfare of his patient. We are glad to see a suggestion to make a serious attempt to educate the insured person. Sir WILLIAM GLYN JONES stated that the Association of Insurance Committees had prepared a model lesson for school-leavers upon the privileges and duties of health insurance.

But the insured person is not the only element requiring education. The medical profession has not been wholly enthusiastic in working the Act, and some may still regard their duties lightly and be apt to perform them in a perfunctory manner. But complaints under this head are becoming more and more a thing of the past. Enthusiasm for the service is needed on both sides, and the approved society respresentatives should realise the debt they owe to the practitioners who have loyally worked the Act under immense difficulties and in the face of grave opposition. We doubt whether the insurance service will attract enough medical men of the highest standing until it is developed and made more complete. Sir THOMAS NEILL, who led the discussion on efficiency, was reluctant to consider extensions of the service until what is at present provided is done well. It seems difficult to explain to the non-medical mind that the whole of medical work is interdependent, that general practitioner service must be supplemented by consultant and specialist services and by hospital provision. It is clear enough to the doctors that much of the prolonged sickness which worries the societies at present might be cut short if prompt hospital treatment were afforded and the necessary additional investigations provided. The well-worn phrase "team-work" was many times on the lips of one or another at the Guildhall Conference, but the phrase rightly covers not only concerted work amongst local practitioners—such as the formation of a rota to cope with urgent calls—but a grand combination in which hospital surgeons and physicians and laboratory investigators all coöperate as they did in the medical organisation of the Navy, Army, and Air Force during the war.

UNDIAGNOSED ABDOMINAL EMERGENCIES.

Two cases of emergency where the source of the trouble appeared to be in the abdomen and was discovered to be in the thorax are described in our present issue by Mr. J. HOGARTH PRINGLE. No better instances could be given of the difficulty surrounding the question whether or no to open the abdomen when the exact diagnosis is not clear. Every surgeon will be in agreement with the premises and conclusions of Prof. C. A. MORTON in his article (p. 298) on the Treatment of Abdominal Injuries. In these cases, where a clear history of injury is to be obtained—an injury consistent with some serious abdominal damage—and above all in cases where there is a penetrating wound, no time should be lost in subjecting the patient to a thorough exploration under the best possible conditions. Occasionally the urgency may be so great that appropriate arrangements for hospital or nursing home cannot be made, and in these circumstances the best must be made of an emergency theatre. Every effort should be exerted to obtain conditions for operating as perfect as possible, since the extent of the injury is unknown. It must never be forgotten that the operation required may be one of the greatest magnitude, calculated to tax the surgeon and his assistants to the utmost.

The general practitioner, though with good surgical experience, may be placed in a dilemma by a sudden call to a case of abdominal injury. He may be forced into immediate interference by one of those syndromes so clearly described by Prof. MORTON, knowing that conditions may be present which are beyond his competence to deal with. Such risks have to be taken, and when no more skilled help is available, are rightly taken. The position in an abdominal crisis without history of accident is, however, very different, and the duty of the practitioner is to be much more cautious of surgery. In cases of

injury, an exploratory laparotomy, even if it reveal no gross injury, is much more pardonable than a similar performance when no injury has occurred. Opening the abdomen in the absence of clear-cut symptoms, or without a very certain comprehension of what may be required, has, we are told, become the fashion. Even though the operation of exploration terminates solely with the removal of an appendix, scarcely abnormal, this operation is hardly beneficial, while if more is attempted in the way of short circuiting it may be definitely harmful. Abdominal exploration in the hands of the most careful and perfect surgeons is followed in a large number of cases by adhesions which may be crippling, and if the surgeon is careless of asepsis the results may, indeed, be deplorable. Maltreatment of an injured limb cries aloud for redress, but the unfortunate viscus anchored, twisted, or anastomosed incorrectly is a hidden and inarticulate plaintiff in the action for damages. If the results of imperfect surgical procedures in the abdomen were as obvious to the surgeon as are the results of imperfect treatment where the eyes or limbs are in question, he might be somewhat more restrained in his activities. The practical surgeon should not only have a sound idea as to when to open the abdomen, but a still clearer notion as to when to get out of the excursion without inflicting damage. The safest principle to adopt is manifestly courage in the presence of an accidental injury and caution in its absence.

THE BACTERIUM PNEUMOSINTES.

THE "discovery of the germ of influenza" by OLITSKY and GATES, of the Rockefeller Institute, has been widely announced. The work of these investigators has been noticed in our columns on several occasions and, as our readers are aware, is concerned with the demonstration that a filter-passing, living organism, just within the limits of microscopic visibility, is the real causal agent of this disease. Such a conception of influenza did not originate with these authors, but has probably developed from the contention of KRUSE in 1914, that the common cold is due to such an organism, an opinion which was extended by the same worker to influenza during the pandemic of 1918. About the same time NICOLLE and LEBAILLY, in France, put forward a similar opinion, whilst the work carried out by two independent sets of collaborators in the British Army is well known. The researches of GIBSON, BOWMAN, and CONNOR, which were published in the thirty-sixth special report of the Medical Research Council, led them to claim that lesions comparable with those of human influenza could be produced in animals by the intranasal and subconjunctival inoculation of blood and sputum from patients suffering from the disease. They also claimed to have cultivated the virus by the Noguchi technique. This research makes rather confused reading and was interfered with by the unfortunate death of GIBSON from influenza. Then the changes in organisation consequent upon the armistice caused it to be brought to a rather premature conclusion; consequently, though extremely suggestive, this work cannot be considered to have been carried out with that rigour of control which is necessary for scientific proof. Nothing has been more destructive to the filtrable-virus theory in this country than the work of ROSE BRADFORD, BASHFORD, and WILSON, who claimed to have cultivated a filtrable organism from a number of conditions, influenza amongst them. These cultures were submitted to ARKWRIGHT, at the Lister Institute, who found many of them to contain other than filtrable organisms and, accordingly, the research was held to have failed.

The work of OLITSKY and GATES, whatever may be the judgment ultimately passed upon it, owes much as regards its inception to previous researches. The first results of the American investigators were published in 1920,[1] and since then numerous other papers have been published by them, especially in the *Journal of Experimental Medicine*, dealing with various aspects of the problem. Briefly, they claim to have cultivated from the human disease a minute cocco-bacillary body, which they have named *Bacterium pneumosintes*, and to have produced in animals with such cultures lesions comparable to the disease in the human subject and identical with those produced in animals of the same species by the naso-pharyngeal washings from cases of acute epidemic influenza. They conclude that this organism, which is capable of passing Berkefeld filters, is the true cause of influenza. Now the first essential in any investigation appears to be the limitation of efforts to elucidate the problem to cases of epidemic influenza. From the clinical side we are faced by a great difficulty. Are epidemic and sporadic influenza identical infections? If not then we must admit that various infections can occasion the same syndrome and the problem becomes very complicated. This possibility seems more remote in the case of the epidemic disease, and for this reason we realise that one of the weightiest arguments advanced against the claims of Pfeiffer's bacillus to be the causal agent is its variability. Morphologically, biologically, and serologically this organism is divisible into such a number of types that it seems highly improbable that it can be the unique cause of an epidemic disease whose characters, at all events in fixed periods of the epidemic, are so constant. In OLITSKY and GATES'S work the material appears to have been well chosen. The basis of their investigation has been the selection of a suitable animal for their experimental work and the finding of a criterion of infection. Animals in general seem singularly resistant to the influenza virus, and this fact has proved a great difficulty in most previous work. The monkey has been chiefly used, but the Rockefeller investigators have found the rabbit more suitable. On the intra-tracheal injection of sputum, crude or filtered, these animals did not develop a fatal illness, but it was found that a rise of temperature and a pronounced leucopænia were indicative of the presence of an infection which, when the animal was killed, showed itself by an œdematous and congested condition of the lungs with patches of hæmorrhagic pneumonia. These experiments were originally planned with the object of producing lesions in the animals which would contain the causal organism, and it was hoped that by successive passages from animal to animal contaminatory organisms, usually present in the sputum, would be eliminated, and the true infecting agent finally survive alone. This expectation appears to have been realised. It further having been proved that the virus causal of these rabbit lesions was filtrable, cultural experiments were proceeded with. By a modified Noguchi technique positive cultures were obtained both from the filtered sputum of human cases and from the lung lesions of experimental rabbits; such cultures, on reinjection, proved capable of reproducing the condition in other rabbits. Further, by agglutination and immunity tests different strains of the organism have been shown to behave similarly, and, moreover, it has been found that on recovery the infected rabbits

[1] Journal of the American Medical Association, No. 74. p. 1497, May, 1920.

are immune from infection by material from another source.

This, though brief, is a fair summary of the work under consideration. There are many side issues of the greatest interest, but also more important considerations in the main theme which call for further comment. Recently MERVYN GORDON, in this country, has confirmed these findings in so far as they refer to the occurrence of a culturable filter-passing microbe in the nasal secretions of influenza patients. And last week the November issue of the *South African Medical Record* reached this country containing an account of the minute organism isolated by Sir SPENCER LISTER on Noguchi medium from pharyngeal washings of influenza patients. The difficulty is one of technique which at present is extremely crude. We might picture, as an analogous situation, a bacteriologist, deprived of the higher powers of the microscope, attempting a bacteriological analysis of infected organic material, such as sputum or fæces, after filtering off visible particles by an ordinary paper filter. Growth there would certainly be upon media inoculated with the filtrate, but in the circumstances it would be extremely difficult to discern exactly what this consisted of, and it would be even more difficult to attempt any correlation between such a culture and a specific disease. We have a somewhat similar position with filtrable viruses obtained from contaminated materials. It is to be presumed that there are many organisms, both saprophytic and pathogenic, of this class, and we readily call to mind the existence in sputum of the encephalitic and keratogenic viruses recently described in this situation, especially by LEVADITI, whilst the American workers themselves have met with growths which they conclude are not the *Bacterium pneumosintes*. The immunological experiments of OLITSKY and GATES suggest that their organism is growing in pure culture. We note, with curiosity, that amongst their control experiments they cultivated the nasal secretions of eight persons suffering from acute coryza and obtained no growth whatever, thus completely failing to confirm KRUSE's findings.

As regards the significance of the organism in human influenza, we may conclude from the quoted work of the Rockefeller investigators, and GORDON's confirmation, that the first of KOCH's postulates has been practically fulfilled. The successful cultivation and sub-cultivation of the organism in like manner fulfils the second of these, whilst the reproduction of the disease by such growths fulfils the third, so far as it concerns the disease in the rabbit. The full proof of the relationship of the rabbit lesion to the human subject appears still to be lacking. In strict justice what we can regard as completely proven is that there is a living virus in the nasal secretions of human influenza cases, which is pathogenic for rabbits, and which, when injected intra-tracheally, is capable of producing influenzal-like lesions. Sir SPENCER LISTER produced a typical attack of uncomplicated influenza in one of nineteen human volunteers whose nose and throat were sprayed with the second generation of a culture from his filter-passing organism. The full demonstration of KOCH's third postulate is always difficult and here it is that the claims of Pfeiffer's bacillus have halted. Sometimes such proof is provided by accident, but more often it is inferred from the appearance, in the patient's serum, of antibodies towards the suspected organism. This line of proof has not yet been explored, but it is in this direction that in the future we must look for a final conclusion as to the meaning of OLITSKY and GATES's original and admirable investigations.

Annotations.

"No quid nimis."

THE CONSTANCY OF THE GERM-PLASM.

AT a time when deplorable housing conditions at home and threatening starvation abroad are causing anxiety for the health of the rising generation, it is some consolation to have our attention recalled to the constancy of the germ-plasm. Weismann may have been wrong in his description of the mechanism, but his conception of continuity has undoubtedly been fruitful in the region of social medicine. It is a recurrent marvel how from generation to generation Nature reasserts herself and provides the raw materials for full and perfect growth from the most unlikely sources. Many examples are given in the Tenth Study in National Deterioration,[1] where Miss M. N. Karn and Prof. Karl Pearson address themselves to the question, what factors in heredity or environment influence the general health of babies. The evil effects of imperfect clothing, of bad feeding, of improper habits on the young of the human species have, they suggest, been deduced hitherto by some instinctive process from observational experience. These deductions have never been statistically tested, and the resources of the Eugenics Laboratory of University College, London, have now been called in to analyse the records of data provided by a baby clinic in a large manufacturing town.

The material consisted of 20,000 or more sheets of questions filled in by the voluntary workers at the clinic. There is a horrible habit among the women in poorer urban districts of using a rubber teat as a baby pacifier; this object is apt to fall into the gutter, or at least into the bottom of a dirty perambulator, when it is restored to the baby's mouth, sometimes with a rub on a dirty apron, sometimes without. Great stress has been laid on the evil results which follow. The Eugenics Laboratory is unable from the figures available to trace any marked influence on the child's health. Judged by these, the pacifier is a better indication of what a baby's health has been than what it is; mothers in bad health are apt to use the nearest means to their hand of keeping their babies quiet. Statistically, the implement is more closely related to the health of the mother than to the health of the baby. The authors turn their attention to the alleged evil of artificial feeding. From the available data they learn that the difference of health between breast-fed and artificially-fed infants is not great when the health and habits of their parents are good. It is the parents of bad health and of bad habits who weight the death and delicacy rates of the artificially-fed babies. These are the deductions that can be made when the material provided by a number of partially-trained field workers is treated without impressionism and without prejudgment. Similar analysis of the more weighty material to be obtained from investigations under medical control is promised, and it remains to be seen whether it will overthrow the accumulating evidence of the infant's ability to weather the storms of early environment. A striking illustration from the other end of life of the constancy of the germ-plasm is given by Prof. Raymond Pearl in a recent monograph on experimental biology.[2] The habit of old age in a family appears to be incorrigibly ingrained. Pearl cites A. G. Bell's study of the Hyde genealogy, and constructs a table showing the influence of longevity in both the father and mother upon the expectation of life of the

[1] Study of the Data provided by a Baby Clinic in a Large Manufacturing Town. By Mary Noel Karn and Karl Pearson, F.R.S. Department of Applied Statistics, University of London. Drapers' Company Research Memoir. Cambridge University Press. 1922. Pp. 128. 15*s*.

[2] The Biology of Death. Being a Series of Lectures delivered at the Lowell Institute in Boston. By Raymond Pearl, the Johns Hopkins University. London and Philadelphia: J. B. Lippincott Company. 1922. Pp. 276. 10*s*. 6*d*.

offspring. Put into words the table shows 20 years added to the average life of a group of people through having extremely long-lived parents instead of parents dying under the age of 60.

Father's age at death.	Mother's age at death.		
	Under 60.	60–80.	Over 80.
Under 60	32·8	33·4	36·3
60–80	35·8	38·0	45·0
Over 80	42·3	45·5	52·7

Pearl adds that a careful selection of parents in respect of longevity is the most reliable form of personal life insurance. So far, all this is to the social good. Biologic law is working continuously towards safeguarding the race.

In another way the persistence of biologic law may turn out to be an evil in the highly developed social community. The relative fragility of boy babies has long been a matter of comment. The large excess of male births is over-compensated by the death of boy babies to the extent that, from school life on, girls are more numerous. The tendency is not local or particular. Boys die in larger proportion than girls at every age, in every country, and from every disease, with the single exception of whooping-cough, the excessive mortality varying from 20 to 40 per cent. Dr. F. E. Wynne, whose prize essay on this subject appears in the February issue of *National Health*, suggests that there is some intrinsic quality in maleness that impairs the hold on life of the male organism as compared with the female, and he traces the diminished survival rate of the male back to a time when fewer males were required for impregnation and when it was biologically desirable that only those most potent to maintain and improve the race should survive. The remarkable exception in the case of whooping-cough, which is much less fatal to male than female children, suggests to Dr. Wynne that the katabolic male responds better to the demand for violent expulsive effort. The disorder is to the boy a form of furious sport and the fact contains the hint to free the growing limbs of male children from artificial restriction and afford full opportunity for natural exercise. What success will attend an effort to neutralise an inborn character can hardly be foreseen.

BILHARZIASIS IN EUROPE.

THE important fact made known by Borges[1] in 1921 that bilharziasis was, and had probably been for some time, endemic in Portugal is one that must have given cause for no little concern. At any rate, the matter was considered of sufficient importance to warrant a special scientific inquiry. The results of this inquiry, conducted jointly by Bettencourt and Borges of the Instituto Camara Pestana, Lisbon, have recently been published in an interesting and comprehensive report.[2] The first case reported on by Borges was a woman of Tavira (Algarve), who had never been out of the locality. The source of infection was found to be the public washing pool, supplied by water from a spring, which while not exactly hot was found to have a temperature of about 80° F. Moreover, the pool proved to be a habitat of a species of mollusc, *Planorbis corneus metidjensis*, constituting a suitable intermediate host for the larval bilharzias. Conditions being thus suitable it is not surprising that several cases of infection were discovered. With few exceptions these were women who were in the habit, barefooted, of washing clothes in the pool. About 70 per cent. of such women were discovered to be infected with bilharzia. Only one male case was recorded, a boy of 13, who was in the habit of bathing in the pool. According to Bettencourt and Borges, the infection was probably introduced from Morocco, and while it seems fairly certain that this endemic focus has been in existence for some time the infection does not appear to have spread to any extent, probably because suitable local conditions are not common. It has on occasion been asserted that bilharziasis is endemic in Greece, but according to Prof. Savas, of Athens, such cases as have been discovered have contracted the disease in Egypt. Since the late war sporadic cases of bilharziasis have become known by personal experience to a certain number of medical men in this country, but such cases have in every instance, we believe, been contracted abroad. On general grounds it might be asserted that the disease is quite unlikely to become endemic in any part of this country. One must not forget, however, that 30 years or so ago a similar assertion might have been made, with a certain show of reason, in the case of ankylostoma, which, however, invaded the Cornish tin mines and created quite a considerable amount of trouble. On that account sanitarians in this country cannot afford to ignore the possibility, remote though it be, of the occurrence of indigenous bilharziasis.

[1] Bull. Soc. Portugaise des Sciences Nat. IX., 1921, 19.
[2] Arquivos de Inst. Bacteriologico Camara Pestana, v., 1922.

THE LIST OF THE ROYAL COLLEGE OF PHYSICIANS OF LONDON.

THE list of the Fellows, Members, and Licentiates of the Royal College of Physicians of London for the year 1922 has just been issued. It contains the names of 370 Fellows and 600 Members, 50 of whom were admitted or re-admitted to membership during 1922. The number of Licentiates of the College on Jan. 1st, 1923, was 14,448. The number of diplomates in special subjects is now becoming considerable, being 1030 for public health, 371 for tropical medicine and hygiene, 64 for ophthalmic medicine and surgery, and 34 for psychological medicine. The classified country list is of interest; the only counties in England now devoid of Fellows or Members are Cumberland, Durham, Lincoln, and Monmouth. Twelve Fellows or Members give addresses on the Continent of Europe. The statement of receipts and payments of the College for the year ending Sept. 29th, 1922, which is bound up with the list, shows a revenue from admission fees of Fellows and Members amounting to £2083, from investments £839, from trust funds £1395, and from examination fees under the conjoint scheme (for five quarters) £10,015. During the year a sum of £6049 was invested without substantially reducing the balance at bank.

THE RESULTS OF TONSILLECTOMY.

SINCE tonsillectomy has become a local anæsthesia operation it has gained much ground. Is its present popularity justified? So little has hitherto been published with regard to the permanent effects of tonsillectomy on adults that it is well to give publicity to data on which the practitioner can form a comparatively independent opinion. The material must be large, the procedure uniform, and the interval between the operation and the date of re-examination must be considerable if these data are to be instructive. It is also necessary that adults and children should be classified separately, as they differ materially in this respect. These conditions have been fulfilled in a paper recently published by Dr. F. Norsk in *Ugeskrift for Læger* for Dec. 7th, 1922. He addressed an elaborate questionnaire to 229 adults (70 men and 159 women) who had undergone tonsillectomy in the ten-year period 1910–19 in a hospital in Copenhagen. The technique of the operation was uniform, and the surgeon who performed the operations also checked the late effects. Of the 130 patients who answered the questionnaire, 72 also presented themselves for re-examination. Of the 102 operated on for recurrent attacks of acute tonsillitis, 85 had lost their symptoms, and 9 had obtained some relief. Of the 33 operated on for peritonsillar abscess, 30 had lost their symptoms and 2 were better. All the 14 patients who had suffered from acute tonsillitis with rheumatic fever were symptom-free, and so were all the four whose chronic

rheumatism had been an indication for tonsillectomy. There were also five cases in which the operation had been performed for tonsillitis with fœtor oris, and only in one case did this symptom persist. An instructive discovery made on re-examination of 72 patients was that the proportion of successes was greatest in the cases in which a clean sweep of all the tonsillar structures had been made. The question is often asked: May tonsillectomy prove actually injurious as well as failing to relieve the symptoms for which it is undertaken? Unfortunately, the answer cannot be emphatically in the negative. In one of Norsk's cases tonsillectomy stirred a latent infection into activity, the operation being followed by a severe septic disease involving the joints and heart and crippling the patient for several years. Some 40 of Norsk's patients wrote complaining of symptoms suggestive of pharyngitis; it is conceivable that this condition may have existed before the operation, having been masked by the more troublesome symptoms associated with the inflammation of the tonsils. It is certainly significant that atrophic pharyngitis was not found in any of the 72 re-examined patients. Three wrote that their capacity for singing had been impaired, and Dr. Norsk is evidently well advised in not recommending tonsillectomy for professional singers if the operation can possibly be avoided.

CHEMICAL CONSTITUTION AND BACTERICIDAL ACTION.

THE recent Mann Lecture at the Royal Society of Arts was devoted to a popular exposition on the Relation between Chemical Constitution and Antiseptic Action in the Coal Tar Dyes, by Mr. T. H. Fairbrother, M.Sc., and Dr. Arnold Renshaw, both of Manchester, who have devoted much time and attention to the subject. Sir Humphry Rolleston, who presided, pointed out the important nature of the work both from a national and economic aspect, and also from its scientific and medical interest. The aniline dyes originally discovered by Sir William Perkin in 1856 had before the war passed almost entirely into the hands of chemical manufacturers in Germany, and it is probable that this was largely due to the comparatively slight financial encouragement given to chemists working on these lines in this country, which contrasted with the wise action of Germany in this matter. Our overwhelming handicap in this respect became obvious early in the war, and it might be hoped that in spite of difficulties this would be permanently remedied by organisations in this country. Sir Humphry Rolleston went on to remark how fascinating from a chemical point of view had become the problem of difference in action due to alteration in structure of a synthetic body; the amount of skilled labour devoted to this problem was well shown by the names "606" and "914" applied to preparations eventually found, after the number of trials indicated, to be suitable by Ehrlich in his epoch-making research on the chemotherapy of syphilis. In the "seventies" the work of Pasteur and Koch had established the specificity of disease—namely, that an infectious disease was due to one kind of germ and to that alone; later it became known that after each infectious disease specific antibodies peculiar to the disease and preventing its recurrence appeared in the patient's blood. The conception of the production of specific drugs which should, when introduced into the body of a patient, kill the parasite (parasitotropic) and not hurt the organs (or be organotropic) of the individual was due to Ehrlich. Before the war Sir Almroth Wright and others, working on the effect of "optochin" on pneumococcic infections, had attacked the same problem, insisting that the bactericidal drug should be monotropic or have a selective affinity for one germ only. This was not quite the same as the recent view that groups of allied mono-organisms were similarly acted upon by the same chemical agent. Sir Humphry Rolleston spoke of the happy combination of two workers: Mr. Fairbrother being a chemist with a brilliant record of work in the war, and now attached to the British Dye-Stuffs Corporation; Dr. Renshaw, a physician-bacteriologist, able to judge of the staining and antiseptic action exerted on micro-organisms by the dyes that his chemical colleague provided. It was by such team-work that real advances in our knowledge were likely to be obtained. Before the war it had been suggested, especially by J. W. Churchman in America, that some relation would probably be found between the power of a given dye to stain a special bacterium or protozoon on the one hand and its power to inhibit their growth or kill them, and during the war much use had been made of aniline dyes as antiseptics, such as acriflavine, malachite green, brilliant green, and rosaniline. The lecturers were able to give some information on these points, and an abstract of that part of the lecture which dealt with selective action on micro-organisms appears on p. 314 of the present issue.

ROYAL SOCIETY OF MEDICINE: THE POSITION OF ASSOCIATES.

WE learn, and we own it is with some surprise, that the new class of Associates in the Royal Society of Medicine has attracted as yet small support. Associates are qualified men or women, British or otherwise, who within five years of their first professional qualification apply to the Council for election as non-corporate Associates of the Society. They cannot vote or take any part in the management of the Society, but, if elected by the Council, they are entitled to all the ordinary privileges of Fellows, with the exception that they do not receive the Proceedings gratis, and their use of the library is limited. They pay no admission fee but only the annual subscription of 3 guineas, payable on Oct. 1st of each year, and after having paid three annual subscriptions an Associate, if elected to the Fellowship, is exempt from paying the admission fee. Associateship terminates automatically on Sept. 30th following the expiration of five years from the date of the Associate's first professional qualification.

Special forms of application can be obtained from the Secretary of the Society, and we commend the scheme to the notice of our readers, as an excellent way of keeping in touch with modern developments of medicine.

TREATMENT OF RECTAL PROLAPSE IN CHILDREN.

THE vast majority of cases of prolapse of the rectum in children can be cured without resort to surgical measures, but those who have had extensive experience recognise that in a few children conservative treatment is unsatisfactory; even when it is eventually successful the treatment may have to be prolonged, the general health suffering from the effects of the rectal catarrh set up and perpetuated by the prolapse. Various suggestions have been made for the relief of such cases. Prof. Rudolf Eden, of Freiburg,[1] reports 10 cases successfully treated with injections of "humanol," a preparation of oil derived from human fat.[2] He injects 30–80 c.cm. of the oil in such a way that it forms a submucosal wall around the anal canal, extending upwards for a distance of 3–4 cm.—i.e., above the sphincters—having previously reduced the prolapse. He states that the immediate effect is mechanical owing to the presence of the oil, but that from the day following the injection the sphincter is found to be contracted, even in those cases where it had been markedly relaxed before the operation. Absorption of the oil takes place slowly, and when complete the mucosa remains firmly fixed to the underlying tissues, which themselves show no tendency to prolapse. This effect is probably due to a mild inflammation in the tissues with subsequent cicatricial formation, the presence of œdema for the first two days indicating the inflammatory nature of the reaction. The injection is carried out under

[1] Münch. med. Woch., Jan. 5th, 1923.
[2] Deut. med. Woch., 1920, No. 39.

anæsthesia, and for safety sake the buttocks are strapped together for 48 hours. Harmful results have not been noted, but in one case the injection had to be repeated 14 days later. Among the cases were some with prolapse the size of a child's fist, 8 cm. long, which immediately recurred after digital reposition. Prof. Eden thinks that the humanol, which is difficult to prepare, might safely be substituted by another more easily prepared neutral fat. L. Findlay and J. B. G. Galbraith [3] recently advocated in our own columns the use of absolute alcohol injections, and reported 41 cases so treated. 1·5 c.cm. are introduced in two places about ¼ in. outside the anal margin to a depth of 2–2½ in. All motions are subsequently passed in the recumbent position, and the buttocks are kept strapped together for a week. In the opinion of these writers the associated diarrhœa is more often the result than the cause of the prolapse. In 37 (90 per cent.) of the cases cure was complete, but in 3 of these the injection had to be repeated before this result was obtained, in 2 cases the condition was improved only, and in 2 no improvement took place. No cases of untoward effects were noted. The result here also was presumably obtained by cicatrisation occurring after inflammation, the sphincter recovering its tone during the period of strapping.

THE FEES OF MEDICAL WITNESSES.

IN a recent case in the Divorce Court Dr. A. M. R. Sinclair, who had been subpœnaed by both sides, when called into the witness box asked that his fees, as a witness, should be guaranteed before he gave evidence. He was perfectly correct in doing so, and we hope that no medical man who wishes to follow this example will be deterred by the tale which follows. Some discussion took place before the undertaking asked for was given, when it was settled that the side which actually called Dr. Sinclair should undertake to pay him a fee of 10 guineas, from which a guinea already paid as conduct-money would be deducted.

Mr. Justice Horridge took a considerable part in the discussion, and the tone adopted by a judge of the High Court towards a member of the medical profession giving evidence before him in a professional capacity requires notice. Mr. Justice Horridge said: "A great many people have to give evidence without making money out of it. They should have the satisfaction of knowing that they are taking part in the administration of justice." When Dr. Sinclair pointed out that he had been to the court on the preceding day and that it was a great waste of his time, Mr. Justice Horridge said: "I do not like to hear a professional gentleman of your position repeatedly telling me he is wasting his time. It is not a proper view to take." Later he said: "I do not care whether it is inconvenient or not. It is very often inconvenient for people to have to come to these courts but they have to come." After a registrar had been consulted as to the amount due, Mr. Justice Horridge further said: "He seems to me about as greedy a doctor as I have ever come across, which is saying a good deal, with regard to fees. But you must undertake to pay him 10 guineas. Then he must give his evidence or take the consequences."

His lordship's observations seem to us to misrepresent the position of a medical witness in civil proceedings. It is perfectly true that many witnesses assist justice by giving evidence without payment, and at a loss to themselves, and a medical man's duties as a citizen do not differ from those of any other layman when he gives evidence as such. When, however, he is subpœnaed in his professional capacity, in order that one of the parties in a civil suit may gain some advantage thereby, the position of the medical man differs from that of lay witnesses. He is then a professional man employed by one of the parties in the interest of that party on account of special qualifications which he possesses. He is not engaged, when called in to attend a patient [and paid for his time and knowledge, that later he may be called upon, outside the daily work of his profession, as a gratuitous witness. No contract is made or implied that at some future occasion he should employ hours, or days, assisting out of benevolence a plaintiff to secure a benefit or a defendant to avoid a loss. A medical man enters his profession with the object of making a living at it. He does not become a doctor in order to assist gratis in the administration of justice any more than does a barrister or a solicitor. As Mr. Justice Horridge has implied that in his personal experience greed is a characteristic of our profession, we may tell him that over and over again medical witnesses, rather than allow a poor patient unable to pay a suitable fee to suffer injustice for want of their evidence, have shown great generosity in such instances. No question of poverty, however, appears to have arisen in the case in question, and the party which called Dr. Sinclair was able to employ as an advocate one of the best known counsel at the bar. We sympathise with Dr. Sinclair in the position.

[3] THE LANCET, Jan. 13th, 1923.

TECHNIQUE IN GRADING MILK.

IN connexion with the recent regulations as to graded milk, summarised in THE LANCET of last December,[1] the Ministry of Health have issued instructions as to the technical examination of the milk and cows. With regard to bacteriological examinations a circular, dated Jan. 13th, states that in the sampling of bottled milk, the whole bottle with the seal unbroken is to be taken, being carried and kept in ice until plated. Otherwise samples are to be taken in 4 or 6 oz. bottles, properly fastened and sealed, and similarly iced. Plating must not be delayed more than 12 hours; a special note must be made if plating takes place more than 30 hours after the time of milking or pasteurisation. The sample may be taken anywhere between the place of bottling and the consumer. Uniform methods of laboratory technique are to be employed by all official bacteriologists; the circular describes the exact method of making the plating medium, which will contain 3 g. of each peptone and Lemco and 15 g. of agar in 1000 c.cm. of tap-water, and will have a reaction to phenolphthalein of between 5 and 10 on Eyre's scale. Precise instructions are also given for making dilutions of 1/10, 1/100, and 1/1000 and plating in Petri dishes, which are to be incubated at 37° C. for 48 hours. Not more than half an hour is to elapse between the dilution of the milk and the pouring of the plates. If amongst the different dilutions there are plates containing from 30 to 300 colonies these are all to be counted, and the number, multiplied by the dilution, reported as the final count. Otherwise the plate that comes nearest to 300 is to be counted, and no plate with less than 20 colonies is to be counted unless there are none with more. If a plate contains more than 300 a part may be counted and the whole plate averaged. For "coli" tests tubes are to be prepared in the manner described, each containing 10 c.cm. of bile-salt lactose peptone water and a Durham's fermentation tube. This medium is made up with 5 g. each of sodium taurocholate and lactose and 20 g. of peptone in 1 litre of water, coloured with neutral litmus solution. One tube is to be inoculated with 1 c.cm. of the sample, two with 0·1 c.cm., and (in the case of Grade A) three with 0·01 c.cm. One uninoculated control tube is also to be incubated. The tubes are to be examined for acid and gas at the end of two days and three days. A special form is to be used for the report, signed by the inspector who took the sample, as well as by the bacteriologist, and stating the time of production, sampling, and arrival of sample at laboratory, the temperature on arrival, and the age (in hours) of the sample when examined.

In connexion with veterinary examinations Memorandum 77/Foods, dated January, 1923, indicates that for tuberculin tests fresh tuberculin

[1] THE LANCET, 1922, ii., 1397.

of a satisfactory make is to be used, the manufacturer's name and the quantity used being stated in the report. The instructions supplied with the tuberculin must be adhered to. The animal's temperature is to be taken three times at three-hourly intervals shortly before injection, and the average noted. Any animal persistently showing an abnormal temperature should not be injected until soon after it has become normal. No animal is to be injected within three months of a previous tuberculin injection. The hypodermic and ophthalmic tests are to be applied simultaneously. After injection the temperature is to be taken every three hours from the sixth to the eighteenth hour, and the results of the eye test simultaneously recorded. If at the eighteenth hour the temperature shows distinct signs of rising, it should be taken again after three hours more. The temperatures must be taken by the veterinary surgeon or by an assistant working under his immediate personal supervision. The certificate is to be given in a prescribed form.

In general veterinary examination, special care must be taken to exclude the following conditions: (1) Tuberculosis of the udder; (2) indurated udder; (3) enlargement of the supra-maxillary lymphatic glands; (4) tuberculosis in any form with emaciation; (5) chronic cough with definite clinical symptoms of tuberculosis; (6) anthrax; (7) foot-and-mouth disease; (8) mastitis; (9) abscess of the udder; and (10) retained placenta. The certificate must be on the prescribed form and must specify the clinical evidence; the milk-producer must remove from the herd any animal suffering from any of these diseases or any other disease likely to affect the milk injuriously, and give information showing how the animal has been disposed of, to the licensing authority.

THE INTERNATIONALISATION OF PUBLIC HEALTH WORK.

THE Health Organisation of the League of Nations, with the assistance of financial support from the Rockefeller Foundation, has commenced the practice of interchange of public health personnel. A number of health officers are chosen by their own Governments to be sent to a specified country where they have the benefit of practical training. Lectures are given dealing with special health problems, and are illustrated by visits of inspection to private and public sanitary institutions. The first interchange of public health personnel took place at Brussels in October of last year, when 22 medical officers took part and eight countries were represented—Belgium, Bulgaria, Czecho-Slovakia, Italy, Poland, Russia, the Serb-Croat-Slovene State, and the Ukraine. The first half of the International Course came to an end at the beginning of November, and on Nov. 11th the medical officers taking part proceeded to Italy where they remained till Dec. 17th, when they returned to Geneva for a final conference. It having been decided that the next interchange of health officers should take place in England and Austria, Dr. D. C. Kirkhope, of the Society of Medical Officers of Health, was present at this conference.

All arrangements for the tour in Great Britain are being made, at the request of the Ministry of Health, by the Society of Medical Officers of Health. A special committee has been set up by the Society, with Mr. G. S. Elliston as secretary, and we are able to give the plan of the work, which, however, is subject to modification. The party, which will consist of 25 persons, will be drawn from 14 countries—viz., Austria, Belgium, Czecho-Slovakia, Denmark, Finland, France, Hungary, Italy, Norway, Poland, Roumania, Russia, Serbia, and Sweden. The officers will make their headquarters at the offices of the Society, 1, Upper Montague-street, Russell-square, W.C. 1. The first week will be spent in London, when they will study the central health administration at the Ministry of Health and the scheme of registration at Somerset House. They will also study the methods of the Metropolitan Water Board and the Metropolitan Asylums Board. Visits will be paid to the Museum of the Royal Army Medical College and to a typical example of the L.C.C. housing schemes. At the end of the week the party will break up into groups of four or five persons, so that they may study health administration. The areas chosen, with the principal officers responsible for conducting the course, are as follows: Birmingham and Warwickshire, Prof. John Robertson, M.O.H., Birmingham; Bradford and York, West Riding, Dr. J. J. Buchan; Glasgow and Lanarkshire, Dr. A. K. Chalmers; Liverpool and Lancashire, Prof. E. W. Hope; Manchester and Cheshire, Dr. Veitch Clark; and Newcastle and Durham County, Prof. Harold Kerr. The groups will remain in the areas to which they are assigned till March 28th or 29th. After the Easter holiday they will reassemble in London on April 3rd, and the three following days will be spent in studying port sanitary administration.

On April 11th the international representatives will depart for Austria with five British medical officers appointed by the Ministry of Health on the recommendation of the Society of Medical Officers of Health. Here a similar course will follow before the officers return to their respective countries.

THE STUDY OF ANIMAL DISEASES.

SINCE the period, some fifty years ago, when the development of the basic sciences reached a stage which appeared to promise a surer foundation for medical knowledge, our conceptions of the facilities required by research workers have undergone considerable change. The first stage was that in which, the waste of clinical material becoming obvious, research departments sprang up in close connexion with charitable institutions. It was soon found, however, that the scientific yield from human material alone had fairly rigid limitations. Investigations on human patients must be confined to observation uncontrolled by experiment, and progress under these conditions is slow. The recognition of this difficulty led to the second stage—the establishment of institutions, unconnected with hospitals, where the primary object should be research. Facilities for animal experimentation were provided, and the material consisted mainly of artificially produced lesions under experimental conditions. Valuable results have emanated from such institutions, but it is gradually becoming clear that the lack of accommodation for the study of naturally occurring disease is hampering progress. The modern demand is for hospitals of a different kind, hospitals where the primary object is the study of disease and where the welfare of the individual patient is subordinate to that of the many other sufferers, actual and potential, from the same disease. Obviously, no hospital for humans could ever fulfil this condition. The provision of stations for the isolation and experimental infection of animals with such diseases as tend to occur naturally among them is clearly the solution. Field laboratories already established in connexion with the University of Sheffield, with the Imperial Cancer Research Fund, and those about to be attached to the National Institute of Medical Research, may be expected to yield results of value not only to human but also to veterinary medicine. It was not until the further progress of human pathology was found to be handicapped by the lack of parallel efforts to grapple with animal diseases that it was generally realised how little time, money, and attention have been paid even to problems of enormous economic importance in this respect. The establishment of a chair of animal pathology at Cambridge, no less than the arrangements being made by the Medical Research Council for an exhaustive investigation into the pathology of distemper, is a sign that workers are at last preparing to cultivate a hitherto neglected field.

It is becoming obvious that in the interest of national economy alone problems connected with the ætiology, pathology, and therapeutics of diseases

which afflict animals must be more actively attacked. The economic importance of concentrating on research into these diseases is well brought out in the last report of the Development Commission,[1] where the influence of the wastage caused by disease on the cost of production of, for example, meat and milk is shown. Practical farmers have been slow to recognise the position, but the reservation of a substantial sum out of the fund established by the Corn Production Acts (Repeal) Act, 1921, for veterinary research may be expected to encourage support from those most interested in the health of animals. There remains another cogent reason for the active study of veterinary pathology. Its advance by experimental methods will still further strengthen the case for animal experimentation, so persistently and tirelessly advocated by the Research Defence Society. In the current number of *The Fight Against Disease*[2] it is stated that this month the Society begins the fifteenth year of its work. During 14 years it has won many friends from among those who were ignorant of the need of animal experiments if medicine is to advance. It is now recognised that the distinctions between human and animal pathology and between human and veterinary medicine, are arbitrary, and that progress is interdependent. When it is realised that the results of such experiments are being used with a view to the alleviation of the sufferings of animals, as well as of humans, any opposition to the main means whereby a science of therapeutics can be built up must surely cease.

SUGAR, ALKALIES, AND ANÆSTHESIA.

THE exact causation of vomiting after anæsthesia being still undiscovered, the use of remedies to prevent this after-effect must be at present empirical. Sugar in some form or another finds high favour with many surgeons and anæsthetists. There is at any rate this to be said in its favour, that it is rarely unacceptable to the patient, and in the case of children is swallowed with the greatest avidity to any required extent. Glucose is here given on the assumption that the vomiting is due to "acidosis," which in its turn is attributed to defective functioning of the liver. There is thought to be a call on the carbohydrates of the tissues. An increased store of glycogen in the liver cells, made possible by the intake of glucose, may assist the hepatic function and save the tissues. In patients with severe post-anæsthetic vomiting there is always diminished alkalinity of the blood; and, indeed, a slight amount of acidosis appears to be almost a constant concomitant of anæsthesia. There is evidence to show, however, that although glucose may reduce the percentage number of cases of vomiting, it does not materially reduce the number of cases of acidosis, making the two phenomena appear to be unrelated. Some authorities prefer to rely on free dosage with alkali during the day or two preceding anæsthesia for preserving undiminished the alkalinity of the blood, and they claim that this measure rather than glucose administration diminishes the frequency of vomiting. It seems an easy and safe compromise to give both bicarbonate of soda and glucose in small oft-repeated doses during the 48 hours preceding anæsthesia. We have heard of nothing but benefit from this practice.

AT the Royal Society of Medicine on Feb. 12th, in the War Section, there will be a discussion at 5 P.M. on the Coöperation between the Members of the Medical Profession and the Medical Services of the Armed Forces, when short papers will be read by Surgeon-Captain A. Gaskell and Surgeon-Captain R. J. McKeown. The discussion will be opened by Air Commodore D. Munro and Major-General C. E. Pollock. Sir Crisp English and others will take part in the discussion. Sir John Goodwin, the President of the section, extends a welcome to visitors, whether members of the section or not.

[1] H.M. Stationery Office. 1922. 3*s*. 6*d*.
[2] Macmillan. 6*d*.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

VI.

THE TREATMENT OF ABDOMINAL INJURIES.

Blows and Crushes.

THE treatment of a patient who has sustained a crushing blow in the abdomen, such as might be produced by a cart-wheel passing over it, always causes grave anxiety. It is well known that in such an injury the patient may suffer severely from shock, and yet there may not be any gross injury of any of the contained viscera, nor any intraperitoneal hæmorrhage. This is an important fact to recognise, for otherwise the abdomen may be opened unnecessarily, and the shock thereby fatally increased. We must therefore have some evidence of serious intraperitoneal lesion, apart from the shock, before deciding on a laparotomy.

Indications for Operation.

What, then, would be the indication for operation as soon as improvement in the condition of shock allowed of this? Perhaps the most important general condition (and by this I mean the condition of the patient apart from physical signs) would be evidence of *increasing* shock. If the pulse was losing in strength, and getting steadily more rapid, or if the pallor were increasing, operation would be indicated. Even if the pulse gained in strength, and yet became steadily more rapid, I should regard that as a suspicious sign of grave abdominal injury. I have observed such a condition in a case of ruptured liver.

It is sometimes considered that the persistence of shock indicates that there is some grave lesion. But certainly it may be prolonged without. I have observed it persist in quite a marked degree for 18 hours after the injury, and yet the patient made a good recovery without any operative interference. The persistence of severe pain, especially if localised to any particular region of the abdomen, would be an indication for operation, and this must not be masked with morphine pending decision. The persistence of vomiting is regarded by some as an indication of damage to the viscera, but I have seen marked and persistent vomiting, associated with shock, after severe abdominal injury, followed by recovery without operation.

Physical Signs.

It is with reference to the presence or absence of certain physical signs that the surgeon has often to depend in deciding the question of operation. Of these one of the most important is shifting dullness in the flanks, as an indication of free fluid in the peritoneal cavity, which would almost certainly be blood. In the absence of very marked intestinal distension the presence of such shifting dullness would be a strong reason for immediate operation. But we must clearly recognise that after an abdominal injury there may be quite a large collection of blood within the abdomen, and no dullness, shifting or stationary. The blood may collect in the pelvis, and the distended intestines be floated up out of the pelvis; the abdomen may then present the signs of resonant distension, without any area of dullness, whereas all the time the pelvis may be steadily filling with blood.

The rapid development of a truly tympanitic abdomen would certainly be suggestive of the escape of gas from torn bowel, but not a gradually forming, moderate resonant distension. The absence of the liver dullness in a distended abdomen is of no value as a sign of free gas, and I have known it absent in an undistended abdomen, such absence leading to an unnecessary laparotomy. Even when the intestine is extensively torn there may not be any escape of

gas into the peritoneal cavity. I operated on a case a few hours after an abdominal injury, and found the duodenum torn across, and no free gas present in the peritoneal cavity. Rigidity of the wall, especially localised rigidity, would be strong evidence of severe underlying injury. But though such rigidity would be a valuable sign if present, its absence is of no negative value. I have found it absent in ruptured intestine, and this has been the experience of other surgeons. The passage of blood from the bowel would seldom be an early enough sign to be of value in helping to decide the question as to the desirability of immediate operation. Vomiting of blood may be present after a blow on the upper abdomen, without any rupture of the stomach.

I have so far been writing of the differential diagnosis of pure shock and injury of viscera or intraperitoneal hæmorrhage. In one of the gravest forms of abdominal injury—rupture of the intestine—no shock may be present, and the patient be able to walk to the hospital. In such a case a fixed pain, or rigidity of the abdominal wall, might indicate quite early the serious nature of the case. The absence of bruising of the abdominal wall does not negative a grave intra-abdominal lesion. The wall yields before the blow, or crush, and is not necessarily the seat of contusion. If the patient has not passed urine for some hours and has an urgent desire to micturate, but only a little blood-stained fluid escapes from the urethra, and the passage of a catheter shows that the bladder is empty, we have strong evidence that the bladder is ruptured, and this calls for immediate operation. In these cases there may be no shock, and if the patient is under the influence of alcohol, and no reliable history is obtainable, diagnosis may be very difficult.

Treatment of Shock.

In all cases in which shock is present it should be treated in the usual way by the application of warmth to the surface (by means of hot bottles) and by raising the foot of the bed considerably (not 6 inches or so). The result of raising the bed on small blocks is almost inappreciable on the patient's trunk as he lies in bed. The lower legs of the bed should be raised on chairs, and if the patient is a child lying on an adult's bed, he should be brought down towards the foot of the bed, so that he may get the full benefit of the tilted position. The most rapidly efficient remedy in combating profound shock is saline infusion by the intravenous method. If intravenous saline infusion is not resorted to, in view of the importance of keeping the bowels as much at rest as possible, and of a possible laceration of the colon, the subcutaneous method of introducing the saline rather than the rectal would be indicated.

Treatment Other than that of Shock.

The persistence of pain so severe as to call for a hypodermic injection of morphine would be suggestive of the need for exploration, and I have already called attention to the danger of masking the symptoms in this way. Moderate pain may be relieved by the application of a light fomentation over the abdomen. It is difficult to see how this can do any harm, and such drugs as aspirin may be safely administered. No nourishment should be given by the mouth whilst the question of laparotomy is being considered, so as to avoid any stimulation either of the stomach or intestinal activity. If great thirst is present, frequent administration of quite small quantities of water is a great relief to the patient, and can do no harm, but it is advisable to give directions to the nurse as to exactly how much each dose should consist of, or a really large drink might be taken.

Wounds of the Abdomen.

Exploration is desirable in all cases in which the depth of the wound is not obviously shallow. Probing is quite unreliable, for the track made by the weapon (perhaps a bullet track) may not be straight enough for the probe to detect penetration into the abdominal cavity, and such an opening, if it exists, may be plugged by a piece of protruding omentum. If penetration has occurred, from either a stab or gunshot wound, the intestine may be penetrated, without any shock, or other immediate indication of so serious an injury. If fæcal matter escapes from the damaged bowel it is not likely to be present in the wound, but to become diffused within the peritoneal cavity. If the patient has been stabbed, there *may* be fæcal matter on the weapon, but its absence would be no proof that the gut had not been injured. By comparing the entrance and exit wounds of a bullet, and mentally constructing its track, an idea may be formed as to whether it could possibly have damaged the intestine; but it must not be forgotten how far out the colon may extend, for if wounded even on its extraperitoneal aspect, it would require careful surgical treatment. If there was no wound of exit a skiagram would indicate the position of the projectile and thus the direction of the track. In all cases of doubt it would be safer to explore rather than to watch for symptoms. By exploration I mean exploration of the wound under an anæsthetic; this would probably necessitate enlarging it. If then penetration is found, the surgeon must be prepared to open the abdomen, and deal with any injury to an intraperitoneal structure he may find. This may involve the suture of divided bowel, but in some cases, particularly in gunshot wounds, he may have to perform an extensive resection of gut, with union of the divided ends, so that the exploration of the wound under an anæsthetic should only be undertaken by a surgeon sufficiently experienced to undertake resection and union of bowel. Once exploration has been decided on, it is an obvious advantage to keep the intestines as quiet as possible by the administration of a full dose of morphine hypodermically. The relief to the patient following this treatment must not be misinterpreted, and the surgeon must not allow himself to be persuaded by the patient or his friends that because he feels so much better no operation is necessary. Apparent improvement under morphine should never alter a decision to operate previously made.

CHARLES A. MORTON, F.R.C.S. Eng.,
Professor of Systematic Surgery, University of Bristol;
Consulting Surgeon to the Bristol General Hospital.

Special Articles.

THE FOLLOWING-UP OF CASES OF VENEREAL DISEASE.[1]

ONE of the most important questions in connexion with venereal disease is that of the following-up of the elusive patient who will not continue treatment until cure has been established. The seventh annual report of the National Council for Combating Venereal Diseases, covering the period from June, 1921, to the end of June, 1922, contains an analysis of replies received by the Council to a questionnaire which was issued to members of the Council, and to branches and organisations represented on the Council, as one means of collecting evidence of opinion with a view to the introduction of legislation. 75 per cent. of replies favoured the giving of powers to health authorities to compel persons suffering from infective disease to remain under treatment; 79 per cent. were in favour of fresh legislation. 32 per cent. of replies expressed the belief that public opinion in their districts was ripe for a demand for legislation; 20 per cent. expressed the opposite view, the remainder being doubtful. Various alternative methods of protection for the public were suggested

[1] Seventh Annual Report of the National Council for Combating Venereal Diseases, June, 1921–July, 1922. Published by the Council, 80, Avenue Chambers, Southampton-row, London, W.C. 1.

by the dissentients, the proposals covering (1) the reporting by medical officers of venereal disease clinics, and by private practitioners, of cases of syphilis and gonorrhœa in infants, children, and adolescents up to the age of 18 to the school medical officer with a request that the school nurse might follow up cases which failed to attend; and (2) Government action making it compulsory for every medical man to treat his own patients. 91 per cent. of replies attached importance to the proposal that legislation concerning the suppression of venereal disease should be a public health matter, and should not be combined with legislation aiming at the suppression of prostitution; 92 per cent. favoured the confidential treatment of persons willing to continue such treatment until they are non-infective, and notification of those who discontinue treatment while still infective; some replies favoured the first part of this proposal, but not the second. 85 per cent. of those persons or bodies questioned saw no reason why public health regulations requiring the compulsory continuous treatment of infective persons should not be impartially administered between the sexes. There was apparently general agreement that any limited form of notification and compulsory treatment introduced should only be operative towards those who had discontinued treatment, and that otherwise confidential treatment should be retained.

In our last issue we dealt with the report of the Committee appointed by the New Zealand Minister of Health to inquire into the position with regard to venereal disease in the Dominion. Among the recommendations of the Committee was one relating to legislation providing for "conditional notification of venereal disease," by which it would be the duty of a doctor to notify to the Health Department, by number or symbol only, each case of venereal disease he treated. The terms of the recommendation were that if a patient refused to continue treatment until cured, and would not consult some other doctor or attend a clinic, it should then be the duty of the doctor to notify the case by name. If the patient continued recalcitrant, the Director-General of Health should be empowered to apply to a magistrate for the patient's arrest and detention in a public hospital or other place of treatment until he should be non-infective. The Committee also recommended provision to deal with cases where persons suffering from venereal diseases were not under medical treatment and were likely to infect others. The Director-General should be empowered to call on such a person to produce a medical certificate, which might be procured free of charge at any hospital or venereal disease clinic. If the person refused to produce such a certificate he or she could then be taken before a magistrate, who might order a medical examination. Penalties, including detention in a prison hospital, should be provided for recalcitrant cases, and all proceedings should be private unless the defendant desired a public hearing. Action along these lines has already taken place in Queensland, as recorded in the annual report for 1922 of the Commissioner of Public Health for the State. "In accordance with Section 159 (6) of the Health Acts, 1900–1917," 448 male patients attending the Brisbane clinics were notified for failing to report themselves at least once in every four weeks. Of these, 418 were written to and warned of the consequences of their action; 205 thereupon reported back to the clinic or official advice was received that they were again under medical treatment for venereal disease. The services of the police were requisitioned in 221 cases; the result of their action in these cases, and in 127 cases regarding whom no information was at hand on June 30th, was as follows: Not traced, 208; warned, 74; dead or left State, 13; in gaol, 2; certificates of cure received, 6; reports not to hand regarding 45. Nine of the patients who did not comply with the warnings given them were proceeded against, and fines ranging from £2 to £5 were imposed. Three other defaulters were found to have left the State, and proceedings against them were withdrawn. Four of the women attending the female clinic were written to during the year for failing to continue medical treatment, with the result that three again reported, and the other transferred to another medical practitioner, from whom the requisite official advice was received. Another woman, written to in the previous year, was warned by the police, and on reporting was found to be free of the disease and given a certificate of cure.

The Council for Combating Venereal Diseases, having considered the American system of notification by number and compulsory detention, and various Continental systems, state in their report that these contain possibilities of grave abuse, their administration tending to result in a form of regulated prostitution, the compulsory clauses being exercised largely in relation to women. Dominion legislation, like that quoted above, being more in accordance with principles acceptable in this country having been applied in the Dominions, the Council communicated with the Provincial Health Departments in Canada; the replies received showed that Canadian medical officers are practically unanimous in believing that the system of confidential notification does not prevent people seeking treatment. The N.C.C.V.D. finds in this country evidences of a steadily-growing public opinion in favour of some form of compulsory continuous treatment.

HONOUR TO THE STRETCHER-BEARER.

"DANS LES BOUES DE LA SOMME."

THE Service de Santé, the medical corps of the French Army, was recently honoured by the city of Paris, which presented to the Medico-Military School of Val-de-Grâce a fine sculptured group representing two stretcher-bearers carrying a wounded man to safety through the mud of the Somme. This group, exhibited at the Salon in 1921, and bought by the Fine Art Commission of the city, is the work of a young sculptor, Mr. Broquet, who was himself an infantry stretcher-bearer and was wounded during the war. The group has been set up in front of the

A sculptured group representing two stretcher-bearers carrying a wounded man to safety. The group in its setting in front of the main entrance of the Val-de-Grâce Medico-Military School, Paris.

main entrance, at Val-de-Grâce, as a monument to the valour of the "other ranks" of the Service de Santé, the officers being commemorated by their names on memorial tablets dedicated on the same day, during May, 1922. The President of the French Republic, the Minister of War, the President of the Municipal Council of the city of Paris, Marshal Joffre, and other notable persons were present; the occasion

took the form of a national tribute to the medical service of the army. Mr. César Caire, the president of the Paris Municipal Council, recalled that wherever the "poilu," the real victor of the war, had gone forward, the stretcher-bearer had always been with him to succour him if he fell. Mr. Viry, a senior medical officer, and president of the Friendly Society

A nearer view of the group, giving more detail.

of Past and Present Students of Val-de-Grâce, regretted it had not been found possible to commemorate on the memorial tablets the names of the auxiliary medical officers who had fallen in the war; only those of the regular service appeared, space and money being alike wanting. Others who should also be commemorated were the 69 chaplains, and many nurses who were killed. One hundred and ten doctors had been killed; 9000 stretcher-bearers had died, 5000 of them from wounds in action. The tablets and the monument were accepted on behalf of the school by the Director, Medical Inspector Jacob, who pointed out the realism of the group, which he said, portrayed the kind of thing many of those present had seen on the battle-fields of the Somme. The work of the stretcher-bearers, he concluded, had saved 60 per cent. of the French wounded, which meant that from February, 1918, to the Armistice they returned half a million of men to the firing line. Mr. Maginot, Minister of War, associated himself with the homage there rendered to the Service de Santé, officers, stretcher-bearers, and nurses, whether of the regular service or of the reserve. At the conclusion of the proceedings, Mr. Millerand, President of the Republic, presented to the school the Croix de Guerre, granted because of the devoted pursuit of science and spirit of sacrifice for others displayed therein during the war.

We are indebted for the photographs here reproduced to Dr. Visbecq, Médecin Chef de la Section Technique, Service de Santé, Paris.

Public Health Services.

Some Points from the Guildhall Conference on Health Insurance.

THE procedure at the Guildhall Conference of bodies interested in the medical service under the National Health Insurance Acts necessarily resulted in the ventilation rather than the orderly discussion of difficulties. For their solution we must await the formation of sectional conferences by the Standing Committee appointed at the Conference. Nevertheless, some important points were made. Sir William Glyn Jones, in his opening remarks on "Title to Benefit," brought out the fact, which is hardly yet generally recognised, that panel doctors are not paid for individual insured persons on their list but that they collectively are responsible for the provision of medical benefit to the whole of the insured persons in the area. The share of the local pool due to each individual practitioner is measured by the relation of his list to those of his colleagues. The figure is measured in units of credit, the credit varying with the acquisition of newly signed medical cards and the loss of record cards, which the practitioner has to return to the insurance committee to be transferred when the insured person elects to make a change of doctor. Migration of population and change of address among insured persons have rendered registration both difficult and costly. But its total abolition on the score of economy would lead either to payment on an attendance basis or to a State service. Sir William Glyn Jones was probably right in suggesting that more accuracy would prove too expensive and that it was doubtful whether doctors would do better on any other system.

In the discussion on "Efficiency of Service Rendered" surgery accommodation was the first and indeed the main subject of criticism. Mention was made of the "insanitary atmosphere in the waiting-room," and speakers on the medical side admitted defect. It must be remembered, however, that in industrial areas the housing shortage has made it very difficult for medical men to find suitable premises, and that the cost of adapting old houses has been prohibitive. The matter rests in the hands of the insurance committees, and panel committees have shown little reluctance to assist in securing all-round improvement. The insured person has his own preferences which are not necessarily hygienic. We call to mind a suburban area where insured persons crowd on to a practitioner's list because they like the open surgery system, although the accommodation is not to be compared with that of a professional neighbour who admits them by the front door into his single consulting-room and a well-furnished surgery where he sees private patients as well. The desire expressed by trade-union representatives that the doctor should furnish insured persons with private cards showing surgery hours and the names of his partners is already met in many places.

The Medical Service Subcommittees came in for much adverse criticism. These tribunals are admittedly not as effective as they might be, but it is difficult to see what could be put in their place. They actually serve a useful purpose, and so long as the system remains of admitting all registered practitioners to the panel there must be some instrument for reviewing the service and winnowing out the chaff. Sir Alfred Warren, one of the whilom severest critics of the medical service, spoke up for these much-abused committees, hinting that approved society representatives were only treated as hostile witnesses when they acted as such. No doubt there is room for education in all parts of a health service, for here efficient work implies that each unit must know how best to coöperate with every other.

Public Health in Local Acts.

Parliament passed 120 local and private Acts during 1922. Their provisions for local gas, water, and electricity undertakings, for trams, railways, and canals, for drainage, pilotage, and fisheries, and for schools, trusts, and Irish divorces are neither very exhilarating to read nor very easy to find, but there are some instructive passages about public health which are worth exploring. For if we find out what new powers our local authorities are obtaining, we can see in what respects the general standards laid down for the whole country by the Public Health Acts are thought to be inadequate. Public health legislation in England has usually thus developed from the particular to the general. One progressive municipality takes a step forward; others move up abreast of it; and finally the pace they set is taken up all over the country and the whole line moves forward together. It was a local Act obtained by Manchester in 1844 which formed the basis of much of our first Public Health Act in 1848. The same tentative and experi-

mental method is still at work to-day. Here, then, in the local Acts of 1922 we can see the latest developments for which keen medical officers and enlightened bodies of borough councillors are pressing. They may not be the first examples of their kind, but they are good evidence of progress.

The boroughs of Cambridge and Ramsgate and the urban district of Padiham have improved upon the national standard by prohibiting the insanitary practice of blowing out carcasses of meat. Butchers who inflate their meat may find it costs them the not very severe penalty of £5. The councils of these same areas and of Doncaster are empowered to make by-laws requiring that meat or other articles of food must be covered while conveyed along any street, road, or place, and that all carts and receptacles for such food be properly clean. Other useful local provisions are those which direct that all dwelling-houses to be erected in future must have "sufficient and properly-ventilated food storage accommodation." At Neath and at Worthing no room or shop where human food is sold, prepared, or stored is to be used as a sleeping place. Doncaster and Ramsgate are insisting that the manufacture of potted meat be carried on only in premises registered for the purpose by the occupier, with a saving clause for hotels. Regulation of the manufacture of ice-cream is not uncommon, and sections which forbid rag and bone dealers to sell food also appear. The Cambridge Act prohibits the use of inedible fats in food.

Many local authorities, including the London County Council, had their hands strengthened by Parliament in 1922 for dealing with verminous persons and filthy premises, and for disinfection against tuberculosis. The infectious and contagious diseases provisions of more than one local Act prohibit infected persons from knowingly engaging in any occupation, trade, or business connected with human food in any manner likely to spread disease. The names of laundrymen to whom clothes from infected houses are sent must be furnished to the medical officer; there is also power for the latter to make medical examinations of the inmates of common lodging-houses where infection is suspected. Compensation may be paid to persons who, at the request of the council or the medical officer, stop their employment for the purpose of preventing the spread of infection. In all the districts already named there is to be a firmer control of Sunday schools and places of entertainment as the potential disseminators of diseases amongst children. Power is taken to close Sunday schools and to make parents keep their children at home. While nothing more was heard of the Smoke Abatement Bill, which the Minister of Health proposed to introduce last summer, and to which the report of Lord Newton's Committee and the conference at Oldham drew attention, Cambridge has meanwhile taken action against the smoke nuisance. There will be a fine for the owner or occupier where, in factories, baths, and washhouses, or places where engines are worked by steam, fireplaces or furnaces are not so constructed as to consume their smoke.

Of course, it does not follow that because a local authority obtains the power to make a by-law, the by-law will necessarily be made or, if made, enforced by adequate penalties. Local authorities live under the shadow of the doctrine of ultra vires. They like to take powers even if they do not immediately use them. Hence the details in these local Acts. If Ramsgate wants to set up an information bureau or to regulate mixed bathing, or if Weymouth wants to run a municipal golf course, it must come to Parliament. But the possession of these by-law-making powers is immensely educative and stimulating. If we find that Bolton or Neath or Worthing have got authority to inspect taximeters, we begin to wonder what is done elsewhere in the country to protect the casual passenger from the not always scrupulous taxicab man. So with public health. The local Acts show the maximum progress of the few. If their advanced standard is reasonable and right, the rest of the country may ask why these provisions are only to be found in local Acts.

Correspondence.

"Audi alteram partem."

THE BRITISH RED CROSS IN GREECE.

To the Editor of THE LANCET.

SIR,—The Chief Commissioner of the British Red Cross Society in the Near East, telegraphing from Athens, concerning the desperate conditions existing amongst the refugees in Greece, including thousands of British subjects from Asia Minor and Thrace, urgently recommends that the Society immediately take over the medical side of the local British Committees' work in Athens. They are badly in need of medical supplies and personnel with which to prevent the spread of various devastating epidemics and to alleviate the distress amongst that portion of the refugee population entrusted to their charge.

The Greek Government are quite unable to cope with the pressing demands made upon them, and the British Committee are doing their utmost, with inadequate means, to assist them. The Society appeals to the British public to support them at once. From Lady Rumbold's Hospital, already established at Dedeagatch in Western Thrace, with 300 beds, assistance could be sent to the villages in the surrounding country. At least three clearing hospitals of 100 beds each are urgently needed in Western Thrace.

The Society therefore earnestly appeals for funds to carry out the work, which will be entirely under the supervision of their officers in the Near East. Epidemic diseases are spreading with great rapidity amongst the refugees who, as stated, include large numbers of British subjects and others of the Christian faith.

Subscriptions should be sent to the Honorary Treasurer of the British Red Cross Society, 19, Berkeley-street, Mayfair, W. Gifts in kind and clothing, which are badly needed, should be sent to the warehouses, 71, Southwark Bridge-road, S.E.

I am, Sir, yours faithfully,

A. STANLEY.

Feb. 5th, 1923. Chairman, British Red Cross Society.

GASTRIC ULCER AND GASTRIC CANCER.

To the Editor of THE LANCET.

SIR,—The acknowledgment by Sir Berkeley Moynihan in his Hunterian Society address [1] of the radiological diagnosis of gastric ulcer as the only definite and certain one is gratifying to those of us who have laboured in this field. My own first series of typical radiograms of chronic gastric ulcer appeared in the Proceedings of the Royal Society of Medicine in 1913. The slides shown by Sir Berkeley Moynihan closely resembled mine of ten years ago. They showed (1) the "niche"—i.e., the base of the ulcer filled with bismuth. (2) The "notch" in the greater curvature, or spasmodic hour-glass constriction of the stomach at the level of the ulcer. Sir Berkeley Moynihan's slides (like mine) showed other features constantly present in gastric ulcer. These include (3) the pronounced dropping and enlargement of the pyloric portion of the stomach—the portion beyond the ulcer. (4) The tense pylorus. (5) The dilated and distended duodenum. These are the chief features to be made out from the photographic plate, but other evidence of the greatest importance and constancy is to be derived from observation with the fluorescent screen. The pyloric distension is seen to be due to strong gastric peristaltic waves beating up against a pylorus which is held closed by spasm—spasm so tight that it imprisons bismuth in the pyloric portion of the stomach for 50 or 70 hours. The distended duodenum is shown to be in a state of most active peristalsis; it is making powerful efforts to overcome a stubborn

[1] THE LANCET, Feb. 3rd, 1923, p. 231.

kink at the duodeno-jejunal junction. In its efforts the duodenum writhes like a serpent. The radiological examination of the stomach and duodenum does not, however, complete the information which the X rays can afford. The bismuth should be followed through, and the investigation finished with a barium enema. In the ileo-cæcal region will be found one or other of the abnormal conditions referred to by Sir Berkeley Moynihan in his lecture: An adherent appendix, anchoring the cæcum and impeding the flow through the lower ileum; an ileal link; a dropped and rotated cæcum causing ileal torsion. In the large intestine will be found, in every case of chronic gastric ulcer, ample evidence of old stasis.

A gastric ulcer is no capricious happening; it is no chance mishap to a healthy member that has given no provocation. A gastric ulcer marks the breakdown of an organ which has been living an unhealthy life in a vitiated environment. When will the eyes of the medical world be opened to this evident truth? Sir Berkeley Moynihan referred to the controversy as to the origin of gastric cancer in chronic ulcer. In my view he is right in insisting that ulcers frequently become cancerous. I am aware that some have asserted that a carcinomatous nodule may appear in the stomach, and that the stomach may attempt to rid itself of the growth by creating an ulcer at the site of the nodule. If this ever occurs it is a pathological curiosity. Radiology gives the strongest possible support to Sir Berkeley Moynihan's view. The form of a chronic ulcer of the lesser curvature, as shown radiographically, is remarkably constant—almost as constant, say, as the form of a fiddle. Now and then the radiologist shows a chronic ulcer, perfectly typical except for one or more slight irregularities of the usual ulcer outline. These irregularities are found, at operation, or on section after excision, to be carcinomatous.

So far Sir Berkeley Moynihan took us with unerring step, but radiology takes us a great deal farther. I have referred already to the exact radiographic resemblance of a gastric cancer, in its early stages, to a chronic ulcer. The resemblance is no mere superficial one; it is fundamental. Not only have we the "niche" and the "notch," we have the big, dropped pyloric portion; the tight pyloric spasm; the distended, "writhing" duodenum. Nor is this all. If we follow the bismuth through (as we should in all cases), we find one or other of the same changes in the ileo-cæcal region, and we find again the evidences of old stasis in the large intestine. No one has a right to assert that cancer of the stomach is a chance happening. It is the final breakdown of a diseased organism; one still capable of carrying on life's functions without obvious failure, but still a diseased organism that has lost its capacity to resist malign influences.

I am, Sir, yours faithfully,

ALFRED C. JORDAN.

Upper Wimpole-street, W., Feb. 3rd, 1923.

THE TREATMENT OF GASTRIC AND DUODENAL ULCER.

To the Editor of THE LANCET.

SIR,—Sir Berkeley Moynihan's Hunterian Lecture on Gastric and Duodenal Ulcer, the report of which is published in your last issue (p. 231), reopens the question of medical and surgical treatment in these conditions. It cannot be denied that in many cases where such ulceration has produced extensive fibrosis, adhesions, and organic obstruction, surgical measures directed towards the stomach are inevitable. When, however, the diagnosis of ulcer has been made in the earlier stages, before such changes have occurred, it is open to question whether medical or surgical treatment should be advised.

Any method of treatment must have two objects—the healing of the ulcer and the prevention of its recurrence. An enormous amount of research has been carried out to determine the factors which produce peptic ulceration and which interfere with its healing; many predisposing and exciting causes have been suggested. One fact, however, would appear to be predominant—namely, the action of acid pepsin of the gastric juice on an area of devitalised mucosa, such devitalisation being the result of toxins introduced by the mouth or carried by the blood-stream from some distant focus of chronic infection. Healing is interfered with by the persistence of these factors, probably assisted by gastric distension, constipation, loss of blood, and malnutrition due to prolonged restriction of the diet. Medicine attempts to deal with these conditions by means of dietetic and alkaline treatment. The diet is so arranged as to be easily digested and palatable, but at the same time plentiful, meals being frequent and of moderate size in order to avoid gastric distension. The diet used is fat and protein rich and carbohydrate poor. The fat is used for its calorific value and its influence on secretion, the carbohydrate is restricted largely because the chief form in which it is taken—vegetables—provides bulk rather than energy, and bulk means gastric distension and mechanical irritation, which it is desirable to avoid. Combined with this dietetic regulation is the administration of alkalies. The object of such alkaline treatment is not so much to combat any hyperactivity of acid secretion, which may, or may not, be associated with peptic ulcer, as to produce and maintain complete neutrality of the gastro-duodenal contents. In so much as pepsin can only act in an acid medium, neutralisation of that medium renders it inert and consequently removes one of the most important factors, causing and maintaining ulceration both in the stomach and duodenum. To achieve this suitable drugs must be administered in suitable quantities. The treatment must, it is true, be continued for a considerable time, but, as the diet consists of ordinary foodstuffs prepared in ordinary ways, it is neither impracticable nor irksome for the majority of people.

But there still remains the most important factor—the cause. If it be not removed, treatment cannot be successful. The cause must be carefully searched for, and, if necessary, surgical measures must be undertaken directed towards the eradication of chronic infection. Surgical treatment of the ulcer is by means of gastro-enterostomy, cauterisation, gastrectomy, &c. This is undoubtedly a radical treatment of the effect, but the cause which has produced the ulcer remains.

That medical treatment in the past has not been too successful is mainly attributable to: (*a*) unsuitable and unpalatable diets; (*b*) failure to fulfil completely the aim of the alkaline treatment; (*c*) concentration on the treatment of the effect—the ulcer—rather than on the cause. If ulcer be diagnosed in its early stages, it should not be impossible to cure it by medical treatment combined with minor surgical measures, directed not towards the stomach, but towards the cause, which lies outside the stomach. Unfortunately the diagnosis of peptic ulcer is extremely difficult by clinical means. The main symptoms are not characteristic of ulcer, but are merely the expression of disturbed gastric function—dyspepsia—which may be equally produced by reflex, nervous, and other factors. Ulceration itself has little in the way of definite or clear-cut clinical symptoms, even hæmatemesis being usually due to diseases of the liver and spleen.

Careful evaluation of the symptoms of dyspeptics, thorough investigation of their causes, combined with adequate and rational treatment, will go a long way towards the prevention of ulcer. When ulceration has occurred, its early diagnosis, which is almost impossible without X ray assistance, should make medical treatment both useful and practicable, and minimise the need for serious and extensive operative measures.

I am, Sir, yours faithfully,

Manchester, Feb. 5th, 1923. NORMAN KLETZ.

EDUCATION IN CANCER PROBLEMS.

To the Editor of THE LANCET.

SIR,—I am afraid I cannot quite agree with your editorial in THE LANCET for Sept. 23rd, 1922, or, at least, with the statement that a campaign of education cannot diminish the incidence of cancer. I find it difficult to believe that if the natives of the Philippine Islands were to stop chewing betel nut, the occurrence of cancer of the cheek among them would not be considerably reduced; or that if the natives of Kashmir were to cease using the kangri basket, cancer of the anterior abdominal wall would not become the rarity that it is elsewhere. Among more civilised peoples there are other sources of chronic irritation, not always so obvious, certainly, yet often susceptible of control or eradication. If these could be abolished, would not the incidence of cancer be lessened? As an example of the sort of lesion that I have in mind, it will suffice to say that we almost never see cancer of the mouth in the United States among the class that is sufficiently high in the social scale to keep this cavity in a clean and healthy condition.

But suppose that a cancer has once started somewhere in the body. Need the situation, even then, be so hopeless as that editorial would have us believe? In the United States, an average period of one year elapses between operation and the first appearance of cancer. Can this period not be shortened; and if it can, may we not expect more than prolongation of life for a few years, as the editorial suggests? We in the States think that the length of time between discovery and operation can be shortened. For we believe that a public which has been taught that tuberculosis is often curable in its early stages, and that the cure for appendicitis is more often surgical than not, can also be taught the relation between chronic irritation and cancer, the earliest signs and symptoms of this disease (in so far as these are known), and its curability if removed in time.

Nor is the belief unjustified. Several American cities now have data to show that the number of early cases of cancer applying for advice has steadily increased since the inauguration of a campaign of education only a few years ago. So we think it the right of every woman in the cancer age to know that slight bleeding, continued throughout the month, may have nothing to do with the menopause but may mean an early, and therefore an operable, cancer of the uterus; and that a small painless lump in the breast may be a cancer which can be removed with good promise of success if there be no delay. And we wish every man over 40 to realise that hæmaturia, or a small painless ulcer about the mouth, or dyspepsia that does not yield promptly to treatment, may be the first warning of death within a year or two, unless prompt action be taken.

The fact that cancer of an internal organ often remains undiscovered until too far advanced for operation is not, in my judgment, a reason against educating the public in respect to the more easily diagnosed cancer of the mouth, breast, and uterus—types now responsible for a number of deaths too large by far.—I am, Sir, yours faithfully,

WM. H. WOGLOM, M.D.,
Associate Professor of Cancer Research.
Institute of Cancer Research, Columbia University, in the City of New York, Jan. 22nd, 1923.

*** We do not object to a public campaign of education; our objection is to the public being led to believe that by spending money on an educational campaign of any kind they will enable the medical profession to prevent or to control cancer. In the present state of our knowledge such a campaign cannot possibly diminish the incidence of the disease. We cannot tell the public which particular form of chronic irritation is responsible for cancer of the breast, of the uterus, of the stomach or rectum, to mention only some common sites. We cannot, therefore, instruct them how to avoid these chronic irritations. To warn the public against all forms of chronic irritations would be to open the door wide to all faddists. According to the work of some American investigators heredity is a factor at least as important as chronic irritation. Are we prepared, then, to go before the public and throw a shadow over the life of every person whose parents or grandparents have died of cancer? Are we prepared even to advise against the marriage of two persons who have a family history of cancer? What we advocate in short is that we should be honest with the public. We should encourage them to seek medical advice and submit themselves to operation at the earliest opportunity. But we must make it clear to them that this is palliative treatment with an uncertain promise of cure. We should not call it the prevention or control of cancer.—ED. L.

THE INTER-RELATIONS OF TUBERCULOSIS AND RICKETS.

To the Editor of THE LANCET.

SIR,—In your issue of to-day's date there is a report of the meeting of the Society of Medical Officers of Health held on Jan. 19th. I was glad to see that Dr. W. J. Howarth has added the effect of sunlight to the evidence I put forward in *Tubercle* of last December, of the parallelism and possible relationship between rickets and tuberculosis as deficiency diseases. This is an interesting and important addition.

I do not think that tuberculosis can be regarded purely as a deficiency disease. So far as we know now, the addition of the necessary factor to the diet will completely cure any deficiency disease at whatever stage the patient may be, although certain results—e.g., mis-shaped bones—may be left. This, unfortunately, is not the case with tuberculosis, either pulmonary or surgical, as we know it. It may be that infection by secondary organisms terminates the period of tuberculosis as a purely deficiency disease, but this is, at least, very doubtful. Nevertheless, there is considerable evidence that rickets has a causal relationship to tuberculosis.

I am, Sir, yours faithfully,

V. F. SOOTHILL, M.D., D.P.H.
Council Offices, Ilford, Essex, Feb. 3rd, 1923.

"CENSURE AT AN INQUEST."

To the Editor of THE LANCET.

SIR,—The above heading, which is becoming unnecessarily frequent, is taken from the *Sunday Times* of Feb. 4th. The facts appear to be that a woman died suddenly within half an hour of her reception into hospital, and the house surgeon, who had the advantage of a history of the case, obtained permission from the friends to make a post-mortem examination. As a result of the sectio he became suspicious of poisoning and took certain steps, not free from criticism, to obtain a chemical analysis. The coroner, a doctor, is reported to have said: "He (the house surgeon) had no right either to give a certificate or undertake a post-mortem examination. . . . It was Dr. S.'s duty to have reported the case to him at once. . . . What he had done had been both irregular and wrong. A sudden death, and one the cause of which was unknown, should always be reported to the coroner at once." However much in error the house surgeon may have been in not labelling his bottles and in failing to notify the coroner when he discovered a prima facie case for special investigation as to poisoning, the coroner himself is in at least equal condemnation in his misreading of the law if he used the words reported. A medical man can (*a*) always give a certificate and leave the responsibility for accepting it to the registrar (see the Registrar-General's statement [1]); (*b*) perform a "sectio" having obtained consent from the relatives or other responsible person. It is no part, as admitted in the authoritative statement of the Registrar-General already referred to, of a medical man's duty to inform the coroner whether the death

[1] THE LANCET, 1887, i., 1144.

be sudden or no, notwithstanding that occasion may arise when it would be both prudent and convenient to do so.

One might anticipate from a member of the medical profession, holding a public position of dignity, a little consideration for a young colleague who has departed from the strict line of prudence albeit not of law. His censure on this young practitioner, and through him on the profession as a whole, has become the subject of much erroneous public comment.

I am, Sir, yours faithfully,
H. A. BURRIDGE.

King's College Hospital, S.E. 5, Feb. 6th, 1923.

THE DIAGNOSIS OF SMALL-POX.

To the Editor of THE LANCET.

SIR,—The difficulty which is sometimes experienced in making the diagnosis of small-pox is a subject not infrequently referred to in the medical press. The diagnostic value of vaccination in some such cases does not appear to me to be sufficiently recognised. Vaccination has not very infrequently "taken" in patients the subject of small-pox up to the end of the first 48 hours period of the *rash*, but, I believe, never later. Therefore, if vaccination "takes" later than this, the very strong presumption is against the disease being small-pox.

In West Africa small-pox has not infrequently been diagnosed from the appearance of the rash, and active measures based on the diagnosis, but vaccination has been effective in the patients subsequent to the period mentioned above as the extreme limit for successful vaccination in cases of small-pox, and the diagnosis was thus in my opinion proved incorrect. The most helpful point to me in differential diagnosis in West Africa, so far as the rash was concerned, was the development of the rash within a skin area of a few square inches. If papule and vesicle or vesicule and pustule are found at the same time in relatively close proximity the disease is almost certainly not small-pox either in a European or native West African.

I am, Sir, yours, faithfully,
Liverpool, Jan. 26th, 1923. R. H. KENNAN.

THE DIPLOMA IN PUBLIC HEALTH.

To the Editor of THE LANCET.

SIR,—The leading article in your issue of Feb. 3rd sets forth clearly and fairly considerations in favour of modifying the new rules for Diplomas in Public Health which are to come into force next year. I shall be glad, however, if you will allow me to state some points on the other side.

The two years' interval between qualification in medicine, surgery, and midwifery, and that in public health is intended to provide for a somewhat greater maturity of thought and outlook on life than the newly fledged licensee or graduate can possess. Specification of how the time may be spent which is not occupied in preparing for the D.P.H. examinations is deliberately omitted. It may be spent in a hospital or laboratory, or as assistant in general practice or otherwise, but whatever be the line followed, a man should be all the better qualified after two years or more have elapsed to enter on an official career which will bring him into daily and responsible contact with the public, public authorities, and his professional brethren in general practice.

The purpose of the six months' practical training under a medical officer of health is obvious; so also is the requirement that he shall, in addition to the wide subject of environmental hygiene, have had administrative instruction in the newer activities of local health authorities—maternity and child welfare, school medical inspection and treatment, &c.—all as set forth in the rules. These are based on the belief that such training is necessary for the health officer. Assuming that to be granted, the time must be found, and in the case of men in Army or Navy or Colonial service, it is a question of study leave. No doubt there may or will be difficulties, but such difficulties are involved in every extension of every professional curriculum, and have to be faced by those concerned. It can hardly be contended that the sanitary staff officer of an army corps has commonly at his disposal facilities for much of the training and instruction now to be required. The same observation applies to the four years "tour of service" in tropical or sub-tropical regions, and to work in India. Can such service give the training to suit a man for an appointment in this country, for which the Diploma in Public Health is primarily designed? I think there must be a misunderstanding as to non-acceptance of training by sanitary officers in the colonies. The rules do not limit the term medical officer of health to men occupied in this country. If the medical officer of Sydney or Melbourne or Montreal or Toronto or Cape Town can give the necessary certificate of instruction in practical hygiene and in all the items (*a*) to (*f*) required by the rules, surely the candidate's training would not be rejected either by a licensing body or by the Medical Council; but inquiry can elicit a reply on that point. The whole curriculum, it should be explained, can be compressed within 10 months, so extending over 12 calendar months.

Briefly, it may be freely admitted that the new diploma will be more difficult to obtain than the old, but when obtained it will mean more. The standard does need to be raised in the interests of the public; all students of medicine are in future to receive regular and specific instruction in preventive medicine, and at the same time men aspiring to official appointments in the local health service will require a higher training than has been necessary heretofore, and the country will reap the benefit. I should, perhaps, explain that being no longer a member of the General Medical Council, I have felt free to state my views directly on the important subject you have raised.

I am, Sir, yours faithfully,
London, Feb. 6th, 1923. JOHN C. MCVAIL.

THE R.M.B.F. GUILD.

To the Editor of THE LANCET.

SIR,—You have been so kind in giving publicity to the work of the Royal Medical Benevolent Fund Guild that we are venturing to draw attention to a point which did not receive sufficient prominence at our festival dinner—namely, that the Guild is fortunate enough to have interested the Drapers' Company in its work, and they have awarded two grants from the Pennoyer Fund to two of our beneficiaries—a boy and a girl—and they have also nominated another girl to a vacancy in Elmslea School. Similarly, the governors of Guy's Hospital have awarded a nomination to Christ's Hospital to one of our boys, and another girl is enjoying a bursary at the Malvern Girls' College.

There must be many of your readers who could allocate or influence further presentations for the use of the Committee. In addition to the 22 cases of various ages for which the Guild is already, wholly or in part, responsible we have applications for help in educational fees and training for a number of small children from the age of 4 upwards, and also from young people who have finished their school course, but urgently need to be helped with their training in some profession or other occupation in order that they may become wage-earning citizens.

The Committee feel that it only requires wide knowledge of these "wants" for the requisite amount of help to be forthcoming from the public, and we therefore beg your readers to voice among their patients the educational work which is being undertaken by the Guild.

We are, Sir, yours faithfully,
MAY BRADFORD,
President.
MARY SCHARLIEB,
Treasurer,
DAISY FRIPP,
Chairman of Committee.

19, Portland-place, London, W. 1, Feb. 5th, 1923.

THE DENTISTS REGISTER.

To the Editor of THE LANCET.

SIR,—Circulars of inquiry as to the accuracy of their addresses have been sent to-day to all persons whose names appeared in the printed Dentists Register for 1922—that is to say, to all persons registered before the passing of the Dentists Act, 1921, under Section 12 (3) of the Dentists Act, 1878, which is as follows:—

"The general registrar may erase from the Dentists Register the name of a person who has ceased to practise, ... and the general registrar may send by post to a person registered in the Dentists Register a notice inquiring whether or not he has ceased to practise, or has changed his residence; and if no answer is returned to the inquiry within six months from the posting thereof it shall be lawful to erase the name of that person from the Register."

Any person coming within the above category who does not receive an inquiry in course of post should communicate with me without delay, in order that there may be no risk of the erasure of his name.

I am, Sir, yours faithfully,

NORMAN C. KING,
Registrar.

Dental Board of the United Kingdom, 44, Hallam-street, London, W. 1, Feb. 2nd, 1923.

CŒLIAC DISEASE.

To the Editor of THE LANCET

SIR,—Those interested in the problem of cœliac disease will be grateful to Dr. J. A. Ryle for his letter published in THE LANCET of Jan. 27th. In it he describes, as found during life, a condition of lacteal obstruction due to tuberculous mesenteric glands in a case which showed at the time of operation fatty stools and gave a history of frequent diarrhœic attacks since childhood. This leads him to suggest that cœliac disease may be due to obstruction of the lacteals from tuberculous or other infection. This suggestion is both interesting and novel, for as he truly says, no such dilatation of the lacteals has been noted in any of the very few autopsies on cœliac cases as yet recorded. In my own two autopsies no disease of the mesenteric glands was found, but in both the mesentery was loaded with fat to a degree very unusual in childhood. As Dr. Ryle says, lacteal obstruction would presumably be more obvious during life than after death, and whether such a condition has been hitherto overlooked time will show. At present I do not feel very ready to anticipate that Dr. Ryle's suggestion will turn out to be the correct one.

1. It is difficult to think of any common inflammation other than tuberculous which could give rise to obstruction of the lacteals, and there is certainly no connexion between cœliac disease and tuberculosis. In my two autopsies no tuberculous foci were found in any part of the body, and in a long series of cœliac cases, many of whom were invalids for years, I have never seen overt tuberculosis develop.

2. I am afraid I cannot agree that the pyrexia and enlarged abdomen are caused by an infection. The former is entirely controlled by correct dieting, and the latter is also largely due to a diet too rich in fat and is seen in other types of steatorrhœa—e.g., pancreatic.

3. A feature of Dr. Ryle's case strikes me as most unlike the ordinary cœliac patient—namely, that as adolescence was reached the diarrhœa became worse: I think most will agree that this is just the opposite of what usually happens. May it not be that the tabes mesenterica and the lacteal obstruction, discovered at the age of 23, should be regarded as complicating and not causing the disease of childhood?

This last consideration makes me feel that we may possibly be led astray by what is found after 20 years of illness, and that perhaps the cause of cœliac disease may more safely be searched for by considering the onset of the symptoms in infancy. I happen to have been able to watch three cases from the appearance of the first signs and onwards. The onset of symptoms was abrupt in all, and accompanied teething. Formed stools, perfectly colourless, were passed for three or four days, after which splashes of bright-green pigment appeared in the fæces. Thereafter the appearance of the stools became more approximated to the normal, but from that time onward symptoms of fat-indigestion became evident and the cases settled down into examples of cœliac disease. There are other instances in which there is a more insidious onset which Dr. Ryle's suggestion might be capable of explaining, but I do not see how we can by this means account for such examples as I have quoted. Such cases suggest to my mind that there is a reflex temporary inhibition of the liver which leads to an escape of bile-salts in the fatty stools, which loss cannot be made up.

I am, Sir, yours faithfully,

Harley-street, W., Feb. 5th, 1923. REGINALD MILLER.

"LUNACY REFORM."

A LECTURE TO TONGUE-TIED GUESTS.

To the Editor of THE LANCET.

SIR,—At the "Lunacy Reform" dinner referred to in your last week's issue the position of those guests who were members of the Board of Control and others identified with asylum administration must have been very uncomfortable. It appeared as if they had been invited to a charming feast in order to be lectured to and reproved, without notice and without any chance of reply. Dr. Lomax spoke from 10 to 11 P.M., apparently by invitation, for no suggestion was made from the chair that he was exceeding the time allotted to him. But the most serious side of the matter is the way in which grave accusations were made against mental nurses and apparently accepted by a large number present, upon one-sided statements, and without the persons involved having any opportunity to defend themselves. There is thus created an un-English prejudice against a class of men and women engaged in work for the community admittedly difficult and anxious. The refusal to make these charges before the Board of Control, who have power to examine on oath—or the Ministry of Health Committee which was independent of the Board—is unfair to patients, and it maintains a cruel sustained attack on the nurses. The devotion of mental nurses and their extraordinary patience is known by all those who work in mental hospitals. They work unseen by the public, without encouragement from committees, with little gratitude from patients or their relatives, and in an atmosphere of suspicion which this agitation is accentuating. True, many are badly educated, some are frivolous, a few are harsh and unfeeling, but as a class they do wonderful work for the community. It is abominable that because they are inarticulate they should be slandered.

If the Board of Control refused to investigate accusations, or would not listen to charges and complaints by patients, then a campaign against them might be justified, but I know from experience that they do not turn a deaf ear to complaints that reach them.

I am, Sir, yours faithfully,

Feb. 5th, 1923. HOSPES.

*** The false impression of cruelty which may be given by those unqualified to appreciate the meaning of various procedures which they witness is well shown by the following extract from the "Revelations of an Asylum Nurse," which appeared in a weekly paper.

"There is an old lady whom they call ——, who has a dreadful bedsore on her back; this they treat with hot grease dropped from a lighted candle—I believe it is what they call an 'amberine' candle; it seems terrible to think there isn't a less painful way of treating this sore."

"There are several patients here with very bad bedsores, all of which are treated with the candle. I cannot find out just what it is called. Some call it 'Amberine,' some 'Ambrille.'"

The asylum nurse was apparently ignorant that the application of ambrine is painless and that its use proved that the treatment at the hospital in question was well up to date.—ED. L.

Obituary.

JAMES RITCHIE, M.D., B.Sc. EDIN., M.A., B.Sc. OXF., F.R.C.P. EDIN.,

IRVINE PROFESSOR OF BACTERIOLOGY IN THE UNIVERSITY OF EDINBURGH.

James Ritchie was born in 1864, son of the Rev. William Ritchie, D.D. He studied arts and medicine in the University of Edinburgh, graduating M.A. in 1884 and qualifying M.B. in 1888. In 1892 he went to Oxford and joined Mr. H. P. Symonds, who died quite recently, in practice. At the same time he worked at bacteriology and gradually laid the foundation of what became the school of pathology of which he was the titular head successively as lecturer, reader, and professor, and always the mainspring and inspiration. Burdon Sanderson gave up the chair of physiology and became professor of medicine in 1895, and it was with his hearty encouragement that Ritchie began the formal teaching of pathology in the University. Regular classes started about 1897. Six or eight or ten men, mostly those who had taken a B.A. in physiology and were stopping up a fifth year to do anatomy with Arthur Thomson, used to meet Ritchie at 4 o'clock three afternoons a week in the two small rooms in the museum assigned for the use of the Regius professor of medicine, and received till dinner time instruction in the theory and practice of pathology under the ideal conditions of intimate personal contact with a great teacher, harrassed sometimes by the cares of practice, but always ready to spend any amount of time helping lame (but generally rather enthusiastic) dogs over the fearful beginnings of practical bacteriology and post mortems. Sanderson gave a few lectures on general pathology and this (with Edwin) was the beginning of the teaching of pathology in Oxford. The thing was so good that it soon expanded into a new department. Ritchie gradually retired from practice as his subject received more ample recognition from the University; he was elected a Fellow of New College in 1902 and it seemed as if Oxford had secured him for good as a regular professor when, to the surprise of most people, in 1906 the attractions of his native heath proved too strong and he returned to Edinburgh as superintendent of the laboratory of the Royal College of Physicians in Forrest-road.

Christmas Island is famous in medical annals as a hot-bed of beri-beri. But the phosphate deposits which brought the Chinese coolies there to live on polished rice also have some pathological interest, for it was a share in the company owning the island which was left to the University of Edinburgh by Mr. Robert Irvine to accumulate till it was adequate for the foundation of a chair of bacteriology. Unexpected prosperity allowed this to be done in 1913, and Ritchie naturally succeeded to the appointment, carrying on through the troublous times of the war and afterwards till the edge of more peaceful progress was in sight. In August of last year he began to have obscure abdominal symptoms, for which no cause could be found until an exploratory operation in October revealed an advanced growth in the tail of the pancreas, from which he slowly went downhill and died on Jan. 28th.

Ritchie will always be remembered as the founder of the study of pathology in Oxford and as the author, along with his lifelong friend Robert Muir, of the famous manual of bacteriology, of which the first edition appeared in 1897, the second in 1899, and others at regular intervals ever since. The characteristics of the book, which have commended it to so many thousands of students of all grades in this country and America, are its sanity and reasonableness. And these are just the qualities which made Ritchie one of the most weighty figures in the history of pathology here during the last 25 years. By what would now be called some sort of inhibition, he was himself almost incapable of carrying out any long laboratory investigation. In the catalogues not more than ten or a dozen papers of original work will be found to his name, and few of them of any great moment. But the work which arose from his personal influence and inspiration and in that atmosphere of the real love of knowledge which there was about him is in quantity very large, and above the average in quality. With a very wide acquaintance with pathology as a whole, he had a soundness of judgment and a standard of performance which many of his pupils look back on as the best part of their education. If a piece of diagnostic bacteriology was worth doing at all, it was worth doing thoroughly, and then he would say "Read Cohnheim."

Ritchie took a prominent part in the foundation of the Pathological Society of Great Britain and Ireland in 1906. He served as secretary and assistant editor from the beginning till 1920, when he succeeded Woodhead as editor. As the journal was printed in Edinburgh, his duties were very far from nominal, and it is wholly due to his continued interest and wise management that the *Journal of Pathology*, bought from the proprietors by a company of members in 1907 when it was at the best a dubious financial proposition, was finally in 1919 handed over as a gift to the Society with a substantial balance in the bank. Through the Society, which has certainly achieved the objects stated in the constitution framed by Ritchie, "to advance pathology and facilitate intercourse between pathologists," and through the journal he exercised a wide influence and always for the good and always on a high level. And here, too, what always stood out was his reasonableness—and his sense of fun and sometimes even of mischief. The University of Edinburgh and the Royal Infirmary, in the management of which in late years he took an increasing share, will miss him in the same way. Anyone in trouble or with a difficulty to solve—in immunity or personal relations or anything else—who knew Ritchie naturally went to him for advice and got the help he wanted. He was one of those cheerfully serene persons who are apt to keep their own bothers in, that they may better help other people with theirs. *Servus servorum pathologiæ.*

A. E. B.

ALEXANDER LEWERS, M.R.C.S., D.P.H.

Dr. Alexander Lewers, the well-known Melbourne physician, who died last September, was the son of one of the pioneers of Creswick, Talbot, Victoria, and received his early education at the grammar school in that town. He afterwards came to London and qualified from St. Mary's Hospital with the English double diploma. Returning to Australia, he became resident medical officer at the Adelaide Hospital for 12 months, and then entered upon general practice at Creswick, being appointed also consulting medical officer to the district hospital. Subsequently, in 1898, he came to England on a post-graduate visit and studied dermatology under the late Sir James Galloway, at the same time obtaining the Diploma of Public Health of the Royal Colleges. He returned to Australia in 1900, and shortly after his return successfully treated the first case of bubonic plague at the quarantine station on Coode Island. Since 1903 he had practised as a physician in Collins-street, Melbourne, commencing also his long connexion with St. Vincent's Hospital as physician to out-patients. This post he held for five years, when he became full physician, and at the time of his death he was senior member of the staff. A clinical school had been established in 1910, at which he became an assiduous teacher, while he was an examiner in clinical medicine at the University of Melbourne. Dr. Lewers was an active member of the British Medical Association, from 1903 to 1914 edited the *Australian Medical Journal*, which was formerly the official organ of the Association, and he was for many years the Australian correspondent of THE LANCET.

Lewers's wide knowledge of medicine, his general literary equipment, and his lucid style made him a very interesting writer. In 1915 he published "Medicine

and Meditation," a series of essays touching on such diverse subjects as euthanasia, drink cures, phrenology, eugenics, physical culture, and school inspection. He was editor in chief of the Transactions of the Eighth Session of the Australasian Medical Congress in 1908, which were published in three volumes. Both as a writer and a speaker, Dr. Lewers showed directness and sincerity, and his judgments were always listened to with respect by his confrères. A modest, sincere, and lovable man, his death has deprived the medical profession in Victoria of one of its ablest representatives.

Medical News.

UNIVERSITY OF OXFORD.—The representatives of the University at the conference on the Courses of Instruction Provided by Medical Schools, held at the University of London on Feb. 3rd, were Sir Archibald Garrod, Regius Professor of Medicine, and Dr. Ainley Walker, Dean of the Faculty.—At a congregation held on Jan. 25th the degree of Bachelor of Medicine was conferred on David Sydney Davies, Magdalen College.

ROYAL COLLEGE OF PHYSICIANS OF LONDON.—Licences to practise have been conferred upon the following 48 candidates (38 men and 10 women) who have passed the recent final examination and have complied with the necessary by-laws:—

H. C. Beccle, Guy's; W. C. M. Berridge, St. Thomas's; F. Beshara, University College; Kathleen Nevill Blomfield, Royal Free; W. G. Booth, Guy's; C. H. Budge, St. Thomas's; H. G. R. Canning, Guy's; T. J. Clayton, Charing Cross; G. S. W. de Saram, St. Bartholomew's; R. V. Facey, Oxford and St. Thomas's; G. E. Fisher, Guy's; S. L. Freedman, University College; J. H. Gann, London; Joan Openshaw Geldard, University College; R. M. Geldart, Cambridge and St. Bartholomew's; F. Guiver, London; P. G. Harvey, Guy's; M. F. Ismail, Middlesex; H. Jackson, Middlesex; A. L. P. Jeffery, St. Thomas's; H. V. M. Jones, St. Thomas's; J. W. Joule, St. Bartholomew's; E. Joyston-Bechal, Guy's; G. Klionsky, St. Bartholomew's; M. A. Lautre, St. Thomas's; L. B. Liebster, London; C. G. Lingford, Middlesex; Barbara Valentine Lucas, Royal Free; J. A. Mackay-Ross, St. Bartholomew's; M. Markiles, Cape and Guy's; R. G. Morrison, St. Thomas's; A. L. te W. Naude, Cape and St. Thomas's; Elizabeth Muriel Nicholson-Smith, King's College; Judith Evelyn Muriel Ormerod, Royal Free; E. Orsmond, Cape and Guy's; A. R. V. Patel, Guy's; M. K. V. G. Pillai, Madras and London; Mary Florence Robertine Pitt, London; Ethel Beatrice Poole, Cardiff and Westminster; T. P. Rees, Cardiff and St. Bartholomew's; Emily Virginia Saunders-Jacobs, University College; P. G. Sedgwick, Guy's; I. I. A. Shaheed, St. George's; G. D. Summers, King's College; S. E. Tanner, University College; R. W. Taylor, St. Bartholomew's; Blanchette Thomas, Cardiff and Charing Cross; and Kathleen Edith Tresilian, London.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—In examinations recently held the following candidates were successful:—

THIRD EXAMINATION.

S. N. Bandyapadhay, Vernon Bell, Eliazer Gelfer, M. L. Hendrie, Elizabeth M. M'Kendrick, Jonathan Johan du Pre le Roux, James Ryan, Hariprasanna Sen, Soo Hock Tan, J. S. Whyteside, and A. C. Young.

Materia Medica.—Trevor Hughes, C. A. Basil, Mollie F. Churcher, A. J. M. Findlater, P. J. Badenhorst, R. D. Jones, and E. G. Douglas.

Pathology.—Malcolm M'Crimmon.

FINAL EXAMINATION.

David Gold, Thomas Cowie Hilston Neil, Charles J. B. Fox, James M. Cromble, Ernest Brazao, Annie Fleming Perry, Hilda Page, Johannes Jacobus Malan, Katherine M. Cellan-Jones, Bernard M'Laughlin, John B. Rodrigo, Ian S. R. Bain, and El Saied et Goharg Sheir.

Medicine.—James S. Bizzett, Edward T. Hall, John J. Mann, James H. Murrell, Ronald M'Donald M'Kinnon, and Charles C. L. Spurring.

Midwifery.—James S. Bizzett, Donald G. Coutts, John J. Mann, James H. Murrell, and Charles C. L. Spurring.

Medical Jurisprudence and Public Health.—John C. Colvin, Donald G. Coutts, James G. Currie, Jitendranath Dey, David K. Fisher, Meyer Goldberg, Charles M. Hinds, Owain ap Vychan Jones, Richard F. Kerr, Lawrence A. Moody, W. Melrose, Archibald Menzies, John Patrick T. Mills, James G. O'Kieffe, George Macgregor Rose, J. J. du Pre le Roux, Robert D. Scorgi, and Hariprasanna Sen.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.—A meeting of this society will be held at the Miller General Hospital, Greenwich, to-day, Friday, Feb. 9th, at 8.45 P.M. Dr. W. H. Payne, the President, will occupy the chair, and Dr. John Parkinson will give an address on Palpitation.

ROYAL INSTITUTION.—The Friday evening discourse on Feb. 16th will be delivered by Prof. A. V. Hill on Muscular Exercise.

RONTGEN SOCIETY.—The ordinary general meeting has been postponed to Feb. 23rd, when a joint meeting will be held with the Physical Society, the subject for discussion being the Measurement of X Rays.

TWO MILLION SHILLINGS FUND FOR MANCHESTER HOSPITALS.—It is proposed to lighten the financial burdens of the Manchester and Salford hospitals by a scheme for raising £100,000. The scheme is to be called the Lord Mayor's Two Million Shillings Fund, and the Lord Mayor of Manchester proposes to open the fund in March, the scheme being run by a representative committee. The local infirmaries have a debit balance of £63,000.

Prof. E. H. Starling has been appointed by the President and Council of the Royal Society to be the first Foulerton Professor, and will carry on his researches at University College, London. Dr. H. W. C. Vines has been appointed to a Foulerton Research Studentship and will work in the medical school of the University of Cambridge. The conditions of the bequest under which these appointments were made have already been detailed in THE LANCET (1922, ii., 190).

Prof. G. Elliot Smith gave the Montgomery lecture on the Movements of the Eyes before the Royal College of Surgeons in Ireland on Jan. 29th. On the following day he lectured before the Royal Zoological Society on Mythical Monsters. Both lectures were delivered in the Hall of the Royal College of Surgeons, and were well attended. On the evening of the 29th Sir William Wheeler, the President of the College, entertained Dr. Elliot Smith and a large company of guests to dinner at the College.

THE LATE DR. W. E. S. SCOTT.—William Edward Sawers Scott died on Jan. 31st at the age of 62. Dr. Scott was a graduate in medicine of the University of Edinburgh, becoming M.B. in 1885 and M.D. in 1889, and was also a B.Sc. Manch. He was one of the best-known medical men in the Withington district of Manchester, where he was in practice for over 30 years. During the war he served in France as a captain in the R.A.M.C. Dr. Scott was an hon. surgeon of the Clinical Hospital for Women and Children, and hon. secretary of the Manchester and Salford Sanitary Association.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART: *Post-graduate Instruction.*—The following syllabus of a special course of lectures, to be given on Thursdays at 5.30 P.M., has been issued: Feb. 15th, Cardiac Arrhythmias, by Dr. F. W. Price; Feb. 22nd, Heart Attacks, by Dr. John Parkinson: March 1st, Heart Disease and Occupations, by Dr. R. O. Moon; March 8th, Some Points in the Treatment of Heart Disease, by Dr. P. Hamill; March 15th, the Differences in the Circulation in Aortic and Mitral Disease, by Sir S. Russell-Wells, M.P.; March 22nd, the Toxic Heart, by Dr. J. Strickland Goodall; March 29th, the Diagnosis and Drug Treatment of Auricular Fibrillation, by Dr. B. T. Parsons-Smith. The clinical practice of the hospital and appointments as clinical assistants are open to members of the course. A fee of £2 2*s.* a month, or £5 5*s.* for three months, is charged. All inquiries should be addressed to the Dean, Dr. B. T. Parsons-Smith, at the hospital, Westmoreland-street, Marylebone, London, W.

OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.—The next annual congress of the Society will be held on April 26th, 27th, and 28th at the Royal Society of Medicine, 1, Wimpole-street, London, W. 1, under the presidency of Dr. A. Maitland Ramsay. The arrangements will be as follows:—April 26th, Morning session: President's opening address. Papers by Mr. R. Affleck Greeves and by Mr. R. Foster Moore on Series of Consecutive Cases of Cataract Extraction by Barracquer's Method. Afternoon session: Discussion on the Disorders of the Blood and their Ophthalmological Manifestations, to be opened by Sir Humphry Rolleston, Sir Frederick Andrewes, F.R.S., and Dr. W. C. Souter. In the evening the Bowman lecture will be delivered by Prof. George E. de Schweinitz on Certain Ocular Aspects of Pituitary Body Disorders, Mainly Exclusive of the Usual Central and Peripheral Hemiopic Field Defects. On April 27th, in the morning, a discussion on the Diagnostic Significance of Proptosis will be opened by Mr. Wilfred Trotter, Mr. Herbert Fisher, and Dr. Angus MacGillivray. In the afternoon a visit will be paid to the London Hospital, Whitechapel. In the evening a demonstration will be given by members. On April 28th Dr. Angus MacGillivray will read a paper on Enucleation of the Eyeball under Local Anæsthesia. Members desirous of taking part in the congress are requested to communicate as soon as possible with Mr. R. Foster Moore, 91, Harley-street, London, W. 1.

BRITISH INDUSTRIES FAIR.—The Fair to be held under the auspices of the Department of Overseas Trade at the White City, Shepherd's Bush, London, from Feb. 19th to March 2nd, will again this year give prominent place to chemicals, drugs, medical and surgical appliances, and scientific instruments.

SMALL-POX.—A case of small-pox was reported at Clitheroe last week. The patient was removed to Blackburn isolation hospital and the sources of infection have been traced. There are 27 cases in the coal-mining district of Clowne, near Chesterfield, Derbyshire. It is stated that none of the sufferers had been vaccinated.

ROYAL INSTITUTE OF PUBLIC HEALTH. — The annual congress will be held in Scarborough from May 16th to 21st, Lord Riddell presiding. The congress will be conducted in the following sections under the presidents shown: (1) State Medicine and Municipal Hygiene, Sir William Middlebrook; (2) Naval, Military, Air, and Tropical Diseases, Lieut.-General Sir Arthur Sloggett; (3) Bacteriology and Bio-Chemistry, Dr. Fred. W. Twort; (4) Women and the Public Health, Lady Dorothy Wood; (5) Industrial Hygiene, Sir Lynden Macassey.

THE LATE DR. G. A. W. SPEAR.—Dr. George Arthur Whitworth Spear died at his residence in Pulborough on Jan. 27th, at the early age of 47. The son of Dr. John Spear, for many years H.M. Inspector to the Local Government Board, he was educated in France and at Oxford, qualifying L.R.C.P. and M.R.C.S. from St. Bartholomew's Hospital in 1899. After practising at Fittleworth Dr. Spear moved, in 1909, to Pulborough, where, besides holding a number of public appointments, he had an extensive practice. He saw service during the war with the 29th Division and with the 17th General Hospital at Alexandria. He married in 1903 a daughter of Mr. Edmund Ashton, of Hatfield, Herts, by whom he had two sons and a daughter.

DONATIONS AND BEQUESTS.—Mrs. Mary Sellars Taylor has left a legacy of £1000 to endow two cots at the Bolton Infirmary, and the same institution has received £1000 from the executors of the late Mrs. Mary Ann Hall, £500 from Mrs. Margaret Knowles for the special appeal fund, and £500 from Mr. and Mrs. George Barnes. The house-to-house collection in Bolton and Farnworth realised £1067, and that at the places of worship £1111.—Mr. Samuel Gamble of Fallowfield, Manchester, left £1000 to the Medical Department of the Baptist Missionary Society, and £200 to the Manchester and Salford Women's Christian Temperance Association.—A sum of £20,000 has been given by Mrs. Marryat, sister of the late Sir James Caird, to Dundee Royal Infirmary, for the purpose of building and equipping two operating theatres and a central electrical department.

NORFOLK AND NORWICH HOSPITAL.—The quarterly report of this institution shows that the in-patients admitted during the last quarter of 1922 had been 778, a slight falling off from the numbers admitted in the corresponding quarter of 1921. The daily average number of in-patients had, however, been 261 as against 237 in 1921. There were 703 operations performed, and 1084 new cases treated in the out-patient department; 1520 accidents and casualties were treated. In the corresponding period of 1921 these figures were: operations, 697; out-patients, 874; accidents, &c., 1587. The total grant from the Norwich Hospitals Sunday and Saturday Fund for the year 1922 amounted to £17,880, an increase of £6600 over the amount received in 1921; this was due to the wonderful success of the contributory scheme. A handsome donation of £1000 had been received from Mrs. C. S. Robinson, for the endowment of a bed in memory of her husband, who was killed in the war. At the last meeting of the board of governors a suggestion was made that some friends of the hospital might like to defray the cost of a new operating table and the installation of a new form of lighting for one of the theatres. Within three days of the meeting three offers to cover the expenditure were received, and the first offer, coming from a friend who wished to be anonymous, was gratefully accepted. Mr. S. H. Burton, consulting surgeon, stated that the operating table was now in full working order, and that the light would soon be installed. The great point about the light was that it was concentrated by parallel rays from above, so that the operating area was well lit and there were no shadows. The X ray and pathological departments were now in full working order. The equipment, which cost about £500, came out of the Red Cross grant, and did not affect the general funds of the hospital. The vacancy in the pathological department, caused by the resignation of Dr. E. W. Todd, has been filled by the appointment of Dr. D. S. Brough. Owing to the increase in the work of this department and the impossibility of obtaining the services of an honorary assistant who would be able to give the necessary time to the work, the assistant pathologist is now a part-time salaried officer.

The Services.

ROYAL ARMY MEDICAL CORPS.

THE following were the successful candidates for commissions in the Royal Army Medical Corps at the competition held in London last month: H. A. Gilkes, M.B., Ch.B Oxf., Oxford University, St. Bartholomew's Hospital; R. Murphy, B.A., M.B., B.Ch., B.A.O. Dub., Trinity College, Dublin; F. C. H. Sergeant, M.B., Ch.B. Liverp., Liverpool University; W. L. S. Cox, M.R.C.S. Eng., L.R.C.P. Lond., University College Hospital.

Maj. J. E. H. Gatt retires on ret. pay.

Maj. E. B. Booth retires on ret. pay and is granted the rank of Lt.-Col.

Maj. D. de C. O'Grady retires receiving a gratuity.

Temp. Capts. H. J. Pickering (granted the rank of Maj.) and T. A. Davies (retaining the rank of Capt.) relinquish their comms.

ROYAL HOSPITAL, CHELSEA.

Capt. R. R. Thompson to be Deputy Surgeon, vice Maj. R. E. Todd, vacated.

MILITIA.

Capt. N. H. S. Maelzer relinquishes his commn. and retains the rank of Capt.

TERRITORIAL ARMY.

The undermentioned relinquish their commns. and retain their rank except where otherwise stated: Capts. R. C. Elmslie (Bt. Maj.) (granted the rank of Maj.), R. E. Apperly, J. E. Adams, I. G. Back, S. Hastings, H. B. Weir, R. V. Slattery (granted the rank of Maj.), and G. E. O. Williams; Maj. D. G. Hall; Capts. J. F. Gaskell, E. C. Crichton, R. C. Canney, and A. S. Daly. Sanitary Companies: Capt. P. A. Galpin.

The following relinquish their commns.: Maj. A. T. Mulhall (granted the rank of Lt.-Col.); Capts. H. R. Dive (granted the rank of Maj.), G. H. Kirby, C. A. Robinson, and D. J. Bedford (all retaining their rank).

Capt. H. Drummond to be Maj.

Second Lt. M. H. Summers, from 8th Bn., Middlesex R., T.A., to be Lt.

General Hospitals: The undermentioned offrs., having attained the age limit, are retired, and retain their rank except where otherwise stated: Lt.-Col. A. G. Barrs; Majs. T. W. Griffith (Bt. Lt.-Col.) (granted the rank of Lt.-Col.), J. Phillips, W. Thompson (granted the rank of Lt.-Col.), R. L. Knaggs, H. S. Walker, and J. K. Jamieson: Capts. R. A. Veale (granted the rank of Lt.-Col.), S. S. Whillis, H. H. Markham, J. W. Heslop, S. McDonald, G. C. Hayes, S. W. Daw, D. Seaton, G. P. Anning, F. J. Stansfield, C. Oldfield, L. A. Rowden, H. H. Greenwood, W. H. Brailey (granted the rank of Maj.), A. Ellison, and F. H. Humphris (granted the rank of Maj.).

Capts. N. Hodgson (granted the rank of Maj.), and V. Z. Cope (retaining the rank of Capt.) relinquish their commns.

The undermentioned from School of Instruction, to be Div. Adjt.: Maj. J. R. Yourell, 46th (North Mid.) Divn.; and Capt. C. Popham to be Div. Adjt., 51st (High.) Div., T.A., vice Capt. H. W. L. Allott, vacated.

TERRITORIAL ARMY RESERVE.

Lt.-Col. T. H. Forrest, from Genl. List, to be Lt.-Col.

Capt. W. Brown, from Genl. List, to be Lt.-Col.

Capt. A. Findlater relinquishes his commission and retain the rank of Capt.

ROYAL AIR FORCE.

W. B. Stott is granted a short service commission as a Flying Officer.

INDIAN MEDICAL SERVICE.

Lt.-Cols. J. H. McDonald and A. W. R. Cochrane to be Cols.

The King has approved the retirement of Lt.-Col. E. H. B. Stanley, Maj. and Bt. Lt.-Col. R. S. Kennedy, and Maj. D. M. C. Church.

DEATHS IN THE SERVICES.

Deputy Inspector-General Alfred Gideon Delmege, R.N., Hon. Surgeon to the King, died on Feb. 2nd, at Blackheath, in his seventy-seventh year. He served with the first detachment of Marines sent out to Cape Coast Castle in the Ashanti War, 1873 (Ashanti Medal), and was in the *Bacchante*, 1879–1882, when the Princes Albert Victor and George of Wales (now His Majesty) cruised round the world. He was awarded the M.V.O. for professional services during the illness of King Edward (then Prince of Wales) in 1898, and had previously served in the Royal Yacht *Osborne*.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

THE ROYAL SOCIETY, Burlington House, London, W.
THURSDAY, Feb. 15th.—Papers to be read:—E. R. Speyer: Researches upon the *Larch Chermes* (Cnaphalodes strobilobius Kalt) and their bearing upon the Evolution of the *Chermesinæ* in General. (Communicated by Prof. G. C. Bourne.) G. V. Anrep: The Irradiation of Conditioned Reflexes. (Communicated by Prof. E. H. Starling.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Monday, Feb. 12th.

WAR: at 5 P.M. (Tea will be served at 4.30 P.M.)
Discussion on the Coöperation between the Members of the Profession and the Medical Services of the Armed Forces in Peace and During War.
Short papers on this subject will be read by Surg.-Capt. A. Gaskell and Surg.-Capt. R. J. McKeown.
Air Commodore D. Munro will open the Discussion, followed by Major-General C. E. Pollock, Sir Crisp English, and others. Speakers will be limited to 10 minutes.
The subject of these papers and the discussion which will follow should be of great interest to all medical men, and the President of the Section (Sir John Goodwin) hopes that there will be a very large attendance. Visitors are invited, whether Members of the Section or not.

Tuesday, Feb. 13th.

THERAPEUTICS AND PHARMACOLOGY: at 4.30 P.M.
Papers:
Prof. A. J. Clark: The Scientific Basis of Non-specific Protein Therapy.
Short Paper:
Dr. H. Blumgart (introduced by Dr. H. H. Dale): The Treatment of Diabetes Insipidus by Intranasal Spraying of Pituitary Extract.

PSYCHIATRY: at 8.30 P.M.
Paper:
Dr. Kinnier Wilson: Involuntary Laughing and Crying.

Wednesday, Feb. 14th.

SURGERY: SUB-SECTION OF PROCTOLOGY: at 5.30 P.M.
Short Paper:
Mr. P. Lockhart-Mummery: New Method of Treating Ischio-rectal and other Abscesses.
Cases and Specimens: Cases and specimens will be shown by:—
Sir Charles Gordon-Watson.
Mr. W. Ernest Miles: (1) Specimen of Adenomyoma of the Rectum. (2) Papilliferous Carcinoma Intussuscepted into the Rectum.
Mr. Lockhart-Mummery: Adenomyoma of the Rectum removed by Abdomino-perineal Excision of the Rectum.
Mr. Shorney Webb: Submucous Lipoma of Transverse Colon causing Intussusception.
Mr. Gabriel: Polyp associated with Stricture of Rectum.
Mr. Percival P. Cole: (1) Colon from case of Dysentery, showing Multiple Perforations. (2) Carcinoma of the Pelvic Colon with Vesico-colic Fistula.
N.B.—Will Members desiring to show specimens kindly notify Mr. Percival P. Cole, 15, Harley-street, W. 1.

Thursday, Feb. 15th.

DERMATOLOGY: at 5 P.M. (Cases at 4.30 P.M.)
Cases: The following will be shown by—
Dr. Bunch: (1) Anomalous Tuberculide. (2) Trichorrhexis Nodosa.
Dr. Arthur Whitfield: (1) Case for Diagnosis. (2) Acarus, from case of Scabies Infected by a Dog.
Dr. J. H. Sequeira: Angeiomatous Granuloma (Kaposi). (Two cases.)
Dr. A. M. H. Gray: (1) Kaposi's "Sarcoma." (2) Rodent Ulcer under Treatment by Arsenic Paste.
Other cases will be shown.
Members of this Section are cordially invited to attend the Meeting of the Section of Tropical Diseases and Parasitology announced for Monday, March 5th.

Friday, Feb. 16th.

OTOLOGY: at 5 P.M. (Cases at 4.45 P.M.)
Mr. G. J. Jenkins will give a Preliminary Communication on the subject of Osteitis Deformans and Otosclerosis.
Cases and Specimens:
Sir James Dundas-Grant will show a case of Nerve Deafness and Vertigo with Unusual Vestibular Reactions (previously shown). Neurological Report from Dr. Worster-Drought.
Other cases will be shown.

ELECTRO-THERAPEUTICS: at 8.30 P.M.
Paper:
Prof. Philippson (Brussels): High-Frequency Currents Applied to the Study of Cellular Physiology.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.
THURSDAY, Feb. 15th.—8.15 P.M., Lieut.-Colonel Sir Leonard Rogers: The World Incidence of Leprosy in Relation to Meteorological Conditions and Its Bearing on the Probable Mode of Transmission. (Preceded at 7.45 P.M. by a demonstration of maps illustrating the paper.)
Lantern Slide Demonstration by Mr. C. F. Massy Swynnerton on the Relation of Some East African Tsetses to the Vegetation.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.
MONDAY, Feb. 12th.—11 A.M., Mr. Maingot: Surgical Ward Cases. 12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Mr. Addison: Surgical Wards.
TUESDAY.—10.30 A.M., Dr. Paterson: Demonstration of Medical Cases. 12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 12 noon, Dr. Burnford: Pathological Demonstration. 4 P.M., Mr. D. Armour: Suppuration of the Scalp and Skull.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Department. 12 noon, Mr. Simmonds: Demonstration of Fractures. 4 P.M., Mr. Dunhill: Some Problems of the Thyroid and Parathyroid Glands.
FRIDAY.—12 noon, Dr. Flett: Radiology. 2 P.M., Mr. Banks-Davis: Diseases of Throat, Nose, and Ear. 3 P.M., Mr. Sinclair: Surgical Cases.
SATURDAY.—9 A.M., Dr. Burnford: Bacterial Therapy. 10 A.M., Dr. Saunders: Medical Diseases of Children. 10.30 A.M., Mr. Maingot: Surgical Pathology.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James's Hospital, Ouseley-road, Balham, S.W.
TUESDAY, Feb. 13th.—4.30 P.M., Dr. Hector C. Cameron: Demonstration of Ailments in Children.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: JAN.-MARCH, 1923.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, Feb. 12th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Lecture:—The Control of Ocular Movements: Mr. Leslie Paton.
TUESDAY, Feb. 13th.—2 P.M., Out-patient Clinic: Dr. Grainger Stewart. 3.30 P.M., Lecture:—The Tendon Jerks and Superficial Reflexes in Diagnosis: Dr. Risien Russell.
THURSDAY, Feb. 15th.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Lecture:—Painful Affections of the Upper Limb and Their Treatment: Dr. Grainger Stewart.
FRIDAY, Feb. 16th.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Lecture:—Cerebral Diplegia: Dr. Collier.
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
NEURO-PATHOLOGY.
MONDAY, Feb. 12th.—12 noon, Pathology of the Neuron: Dr. J. Godwin Greenfield.
N.B.—A Course of Lectures in the Anatomy and Physiology of the Nervous System will be given if there are sufficient entries for it.
The fee for the whole Course, including Anatomy and Physiology, is £12 12s., but these Lectures may be taken separately for a fee of £4 4s. Course without Anatomy and Physiology Lectures will be £10 10s. Any part of the Course may be taken separately at a special fee. Special arrangements will be made for those unable to take the whole Course. Fees should be paid to the Secretary of the Hospital at the office on entering for the Course.
C. M. HINDS HOWELL, Dean of Medical School.

NATIONAL HOSPITAL FOR DISEASES OF THE HEART, Westmoreland-street, Marylebone, W.
POST-GRADUATE COURSE: February and March.
THURSDAY, Feb. 15th.—Dr. F. W. Price: Cardiac Arrhythmias.

HOSPITAL FOR SICK CHILDREN, Great Ormond-st., W.C.
THURSDAY, Feb. 15th.—4 P.M., Dr. Hutchison: Infantilism and Allied Disorders of Development.

ST. JOHN'S HOSPITAL, 49, Leicester-square, W.C.
THURSDAY, Feb. 15th.—5 P.M., Dr. W. Griffith: The Skin Eruptions of Syphilis.

MANCHESTER ROYAL INFIRMARY, POST-GRADUATE LECTURES.
TUESDAY, Feb. 13th.—4.15 P.M., Dr. F. E. Tylecote: The Part Played by Vascular Spasm in Disease.
FRIDAY, Feb. 16th.—4.15 P.M., Mr. J. Morley: Applied Anatomy of the Gastro-Intestinal Tract.

ST. MARY'S HOSPITALS, MANCHESTER. POST-GRADUATE LECTURE (at Whitworth-street West Branch).
FRIDAY, Feb. 16th.—4.30 P.M., Dr. J. F. Ward: Albuminuria in Childhood.

SALFORD ROYAL HOSPITAL. POST-GRADUATE LECTURE.
THURSDAY, Feb. 15th.—4.30 P.M., Dr. Corsar Sturrock: Epilepsy.

ROYAL INSTITUTE OF PUBLIC HEALTH, 37, Russell-square, W.C.

WEDNESDAY, Feb. 14th.—4 P.M., Dr. A. H. Gosse: Public Health Aspects of Pulmonary Tuberculosis.

Appointments.

HALL, A. W., L.R.C.P., M.R.C.S., has been appointed House Surgeon to the Kidderminster Infirmary.

Vacancies.

For further information refer to the advertisement columns.

Barnsley, Beckett Hospital.—Jun. H.S. £200.
Bradford Royal Infirmary.—Two H.S.'s. £150.
Cambridgeshire Mental Hospital, Fulbourn, near Cambridge.—Second Asst. M.O. £350.
City of London Hospital for Diseases of the Chest, Victoria Park, E.—Asst. M.O. £100.
City of London Maternity Hospital, City-road, E.C.—R.M.O. £100.
Derbyshire Education Committee.—Asst. School M.O. £600.
Derbyshire Hospital for Sick Children.—Res. M.O. £150.
Gloucestershire Tuberculosis Institution, Standish House, Stonehouse, Glos.—Asst. R.M.O. £300.
Ipswich, East Suffolk and Ipswich Hospital.—H.S. £125.
Kensington, Fulham, and Chelsea Hospital, Earl's Court, S.W.—Clin. Asst. £30.
Liverpool Education Authority.—Sen. Asst. Sch. M.O. £750.
Liverpool, Royal Southern Hospital.—Res. Cas. O. £150. Also Two H.P.'s and Three H.S.'s. Each £100.
London County Mental Hospital Service.—Seventh Asst. M.O. £449.
Manchester Children's Hospital, Pendlebury.—Res. M.O. £80.
Manchester, Whitworth Park Hospital.—Res. Surg. O. £250. Also H.S.'s. £100 each.
Nottingham General Dispensary.—Res. Surg. £300.
Rosslynlee Asylum, Rosslyn Castle.—Asst. M.O. £300.
Rotherham Hospital.—Jun. H.S. £150.
Royal Eye Hospital, St. George's Circus, Southwark, S.E.—Hon. Asst. S. Also Clin. Assts.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. P. to Skin Dept.
Southampton, Royal South Hants and Southampton Hospital.—Jun. H.S. £150.
St. Paul's Hospital for Skin and Genito-Urinary Diseases, Red Lion-square, W.C.—Res. M.O. £300.
Swansea General and Eye Hospital.—H.P. £200. Also H.S. for Ophthalmic, &c., Depts. £200.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Cas. Sorting O. and Anæsth. £150.
West End Hospital for Nervous Diseases, Regent's Park, N.W.—Senior H.P. £150. Also Jun. H.P. £100.
West Hartlepool, Cameron Hospital.—H.S. £200.
Wolverhampton and Staffordshire General Hospital.—H.S. £200.

The Chief Inspector of Factories, Home Office, London, S.W., announces the following vacant appointments: Ventnor (Isle of Wight), Llanwrtyd Wells (Brecon), Honiton (Devon), and Knighton (Radnor).

Births, Marriages, and Deaths.

BIRTHS.

FOULKES.—On Feb. 4th, at Exeter, the wife of Richard K. Foulkes, of a daughter.

GOODWIN.—On Jan. 28th, the wife of Cecil G. R. Goodwin, L.R.C.P. (Barrasford Sanatorium, Northumberland), of a son.

MARRIAGES.

BLAIR—WOODHOUSE.—On Jan. 17th, at All Saints' Church Hull, Robert Bertram Blair, M.B., F.R.C.S. Edin., to Frances Mary, fourth daughter of Dr. Herbert Woodhouse, C.B.E., J.P., and Mrs. Woodhouse, of Roos in Holderness, and The Park, Hull.

BROWN—EMERY.—On Feb. 5th, at the Golders Green Wesleyan Church, Oscar F. Brown, M.A., B.Sc. Oxf., to Doris Kathleen Emery, M.R.C.S., L.R.C.P.

MACGILLIVRAY—CUSHNY.—At St. Cuthbert's Church, Edinburgh, on Feb. 2nd, 1923, by the Rev. P. Dunn, D.D., Dr. Alex. G. MacGillivray, of Southwaite, Cumberland, elder son of Dr. C. W. MacGillivray, to Helen Ogilvie Cushny, only daughter of Prof. Cushny, University of Edinburgh.

DEATHS.

COGILL.—On Feb. 2nd, at Seaton, Devon, Harry Cogill, M.R.C.S., L.R.C.P., of Queen Anne's-gardens, Bush Hill Park.

DELMEGE.—On Feb. 2nd, at Westcombe Park-road, Blackheath; Deputy Inspector General A. G. Delmege, R.N., M.V.O., K.H.S., aged 76.

PYWELL.—On Jan. 30th, at a nursing home at Ewell, Percy Dodd Pywell, M.R.C.S., L.R.C.P., late of York-road, S.E.

SINCLAIR.—On Jan. 29th, at The Moorings, Paget-road, Ipswich, Walter William Sinclair, M.B., aged 54.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

DEPOSIT CONTRIBUTORS TO NATIONAL HEALTH INSURANCE:

DRAWBACKS OF THE SYSTEM.[1]

BY HAROLD S. BEADLES, M.R.C.S. ENG.,

SECRETARY OF THE WEST HAM LOCAL MEDICAL AND PANEL COMMITTEES; AND CHAIRMAN TO THE WEST HAM INSURANCE COMMITTEE.

IN introducing the subject of the position in National Health Insurance of that class of the insured community known as the deposit contributors I desire to keep prominently before our minds the fact that the National Insurance Act is claimed to be "An Act to provide for insurance against loss of health and for the prevention and cure of sickness." The inauguration of such a social reform as National Health Insurance, influencing as it did practically every phase of Great Britain's communal life, was necessarily complex. The early administration of the measure was not rendered less difficult by the effort made in the construction of the Act of 1911 to legislate for the then known varying circumstances of employed persons, whereby over 20 separate classes of insured persons were provided for. At the date of this conference material improvement has been brought about by piece legislation in the direction of simplification. The most important class of "employed" person remaining to be dealt with, however, is the deposit contributor class.

Position of the Deposit Contributor.

Deposit contributors and their employers pay the same contributions as those paid by and in respect of members of approved societies; but the contributions are carried into a separate fund and individual account is kept of the sums paid in respect of each contributor. The first charge on a deposit contributor's account is his share of the cost of medical benefit and administration, and this charge for the current and next benefit half-year must be met before any payment for other benefits can be made. Payment of benefit depends in individual cases upon the amount standing to the person's credit. Thus the title of "insurance" applied to the contributions extracted from, and the benefits set aside for, the people of this group is a gross misnomer, and the intention announced in the preamble of the National Health Insurance Act is defeated so far as the deposit contributor is concerned.

The limitations indicated above and the consequent suspension from benefits upon exhaustion of credit, and subsequent reinstatement to medical benefit upon acquisition of contributions, tends to render the administration of medical benefit to deposit contributors a matter of considerable complexity, involving an undue volume of administrative work by the Government department, the insurance committees, and the insurance practitioners, since, in comparison with members of approved societies who can, within certain limits, draw as required on a common fund built up by the contributions of all the other members, and who, once in the society of their choice, with few exceptions remain there—the suspensions from, and other operations in respect of, medical benefit and reinstatements are proportionately more numerous than those of society members. The normal changes in an insurance practitioner's list due to alterations of status of approved societies' members cause the practitioner considerable difficulty and sometimes doubt, but his difficulties and doubts are multiplied by the transfers to societies and the variation in the status of deposit contributors.

From this aspect the subject is of considerable interest to insurance practitioners, insurance committees, and approved societies; every possible effort should be exerted by all concerned to reduce as far as possible the administrative details connected with National Health Insurance. But how does the system affect the patient? I have seen it stated that deposit contributors form "a group demanding prior consideration of its needs as being most urgently in want of qualified medical assistance and financial support." The author of these words probably accepted without question the dictum that the bulk of "employed persons" who did not join approved societies were derelicts in health. It is possible that the facts will prove otherwise. I believe that in 1911 and 1912, when certain approved societies were "signing on" members under the National Health Insurance scheme, practically no regard was had to the

[1] A paper introducing a discussion at the Guildhall Conference on Medical Service under the National Health Insurance Acts.

physical condition of the proposer. We know that the "application for admission" form required answers to questions on that point, and that later, when claims were received by some societies, they proceeded to investigate the application forms with a view to the possibility of evading sickness and other benefits liabilities by the discovery of false declaration of physical conditions; but, generally speaking, societies took in and retained all and sundry without making ill-health an insuperable bar to membership.

Reasons for that Position.

I suggest, therefore, that there are other equally weighty reasons why contributors remained and still remain under the "deposit" arrangements. Consequently I would set the principal reasons down in the following order of precedence: (1) Ignorance and ineptitude: for example, the notion held by some persons that by not joining approved societies they retained complete independence, or the view held by other persons that by contributing to State insurance through the Post Office or as "Post Office contributors" (as they were at one time called) they secured a greater measure of State support and guarantee. (2) The influence upon some persons of the knowledge that upon death or emigration, deposit contributions were partially recoverable by the contributor or by the next-of-kin, and that this power of recovery did not rest with an approved society member or his representative. (3) Ill-health causing inability, after the first rush of applications for membership, to secure admission to approved societies, or if such admission had by chance been secured, causing expulsion from approved societies.

Experience in a Single Area.

I cannot venture to say what proportion of deposit contributors is now represented by persons actuated by one or other of these three causes. Possibly a fairly clear idea on this subject might be forthcoming from an examination of the detailed records in the possession of the Controller of National Health Insurance. I have not had time to obtain this information, and I am compelled to base my observations upon the limited experience of the West Ham area, with which I am intimately connected. There is little doubt, I think, that during the first year or two of the operation of the Act the larger proportion of deposit contributors represented persons who, though good lives, continued as such through sheer ignorance, and that between then and now this proportion has gradually undergone diminution. I think the experience of my own area furnishes an excellent criterion for the country as a whole. Here we had, in 1913, some 4450 deposit contributors on register as entitled to benefits. By January, 1923, this number had been reduced to 2200. The factors operating in the net reduction of 2250 were: (*a*) Total new entrants as deposit contributors 8950; (*b*) suspensions from benefit (of which it is fairly certain that a considerable number represent undetected transfers to societies) 6800 gross, and after deducting 2100 reinstatements 4700 net; (*c*) transfers to approved societies 1500; (*d*) enlistments 300; (*e*) deaths 100; (*f*) removals abroad, 150. Total dropped out 6750. Thus, of the total number of deposit contributors registered for the area 52 per cent. have been suspended without recovery for various reasons, the principal reason being assumed to be that of undetected transfers to societies; 17 per cent. have, without doubt, transferred to societies; 6 per cent. have died, emigrated, &c., whilst 25 per cent. still remain deposit contributors Of the 2250 deposit contributors still on our register 1200, or 53 per cent., have chosen and are on doctors' lists, while 1050, or 47 per cent., have not selected doctors; as compared with 78 per cent. and 22 per cent. respectively for the whole of the insured persons of the area.

Problem of Extension of Full Insurance to Deposit Contributors.

The question now arises, what is to be done? Are deposit contributors to be allowed to drift on, causing unnecessary confusion in health insurance for an indefinite period, in the hope that they will in the end disappear of themselves, or shall they be brought into line forthwith? As I have already shown, the problem has so far as a considerable proportion of the original deposit contributors is concerned (estimated at 50 per cent. in my own area) solved itself by transfers to approved societies. I am inclined to think that but for the war and subsequent unemployment difficulties, this form of absorption would have been far greater; be that as it may, the advisability of placing all insured persons upon an equal footing as regards insurance remains a vital problem.

I contend that full insurance should be extended to deposit contributors whether the majority be healthy or unhealthy persons. If the majority represent good insurance subjects, their surplus of contributions should be made available for the assistance of their less fortunate fellows. On the other hand, if the majority represent bad insurance subjects, then they should be given the maximum measure of security purported to be given by the insurance laws.

Suggested Methods of Dealing with the Problem.

The three methods of dealing with the group which seem to me to be the most feasible are presented as follows: (1) Complete nationalisation of health insurance—that is, the construction of a scheme whereby all persons shall pay equal contributions for which they shall be entitled to receive equal benefits; (2) allocation of all deposit contributors to the present approved societies; and (3) constitution of a separate approved society or association for persons who do not join an approved society within a limited time.

With regard to the first method, the complete nationalisation of National Health Insurance is undoubtedly the only way to attain the ideal held forth in the preamble of the 1911 Act. On the other hand, the present approved society system is firmly established and working for good or ill, and transition to the territorial system would present difficulties and initial expense which might preclude any attempt in that direction at the present time of financial and economic strain. With regard to the second alternative, I suggest there should be certain conditions attached to any allocation of deposit contributors to approved societies. Of them I would mention as the most important: (*a*) that each deposit contributor should be given notice of power to select a society within a given time; (*b*) that deposit contributors who have not exercised their right within such given time should be allocated to societies selected by the Ministry of Health; (*c*) that the right of approved societies to refuse members upon health grounds should be withdrawn; and (*d*) that the surpluses and deficiencies of all approved societies in the Kingdom should be pooled for the benefit or otherwise of all persons insured under the National Insurance Acts. With regard to the third and last alternative, I suggest that this is at the moment nearest to the solution of the problem. Its accomplishment would, of course, need new legislation based upon knowledge obtained from very careful scrutiny of the past ten years' experience for the whole country. The successful construction of a separate National Health Insurance society or association of persons not attached to an approved society naturally depends entirely upon the general average health standard of such persons being equivalent to or higher than the standard of that of approved society members. The last valuations of approved societies established that, generally speaking, members of societies had been a good insurance proposition at the contribution rates prevailing over the valuation period.

In the absence of any knowledge of a valuation of the deposit contributors' fund or of the operations on the deposit contributors' accounts as a whole during the past ten years, however, it is extremely difficult for me to present any data which will assist in arriving at a decision whether deposit contributors do in fact represent a good insurable class at present rates. The only information to be gleaned from the report of the Ministry of Health on this point is that as regards England, at the 31st December, 1921, 250,000 personal accounts remained open, that 75,000 applications for transfer to approved societies were received during the year 1921, and that during the same period £35,834 was paid in sickness benefit—only nine payments being in respect of disablement benefit—£16,224 was paid in maternity benefit, £938 was paid upon death, and £765 was paid on emigration; while at the 31st December, 1919, the balance in the fund was £958,733. Unfortunately those meagre facts do not give much help. Other data are required before our discussion thereon can be other than purely academic. But why should deposit contributors as a group be barred from extra benefits and disablement benefit in its entirety, and the more unfortunate of the deposit contributors be cut off from all benefits upon exhaustion of individual credits when the central fund balance exceeds £900,000?

In West Ham during the last five years—viz., January, 1918, to January, 1923, the average number of deposit contributors on the register was 3086; the number of persons who claimed sickness benefit was 696; or only 22 per cent. The number of persons whose claims were fully paid was 462, or 66·4 per cent. of the claimants, and those who suffered loss or diminution of benefits by reason of exhaustion of balance was 234, or 33·6 per cent. of the claimants. (Once 218 persons; twice, 16 persons.) The number of sickness benefit claims certified during the period was 2816. The number of claims paid was 2531, while the number unpaid owing to the balance exhausted was 285. The number of claims for maternity benefit certified during the period was 631, of which 471, or 75 per cent., were paid in full, 29 were paid over three-quarters of the amount, 35 were paid between half and three-quarters of the amount, 39 were paid less than half of the amount, and in 57 cases—less than

10 per cent.—no part of the amount was paid because the balances had been exhausted or for some other reason.

I cannot, of course, claim finality in the conclusion to be deduced from these figures, but I suggest that with the experience of sickness benefit claims of only 22 per cent., the payment of sickness benefit claims in full to the extent of 66⅔ per cent., and of the payment of maternity benefit claims in full to the extent of 75 per cent. in a great industrial area such as mine, coupled with the enormous balance that appears to be standing in the Central Deposit Contributors' Fund, a prima facie case is presented in favour of the suggestion that deposit contributors as a group form a good insurance proposition.

Assuming, therefore, that deposit contributors as a whole are good insurance subjects from the general average health aspect, I suggest that a National Health Insurance Association of these persons, administered by the present insurance committees jointly, is within the realms of practical politics. The present position of these people represents one of the most glaring injustices of the National Health Insurance Acts. The fact that many of the people concerned may be voluntarily suffering injustice does not, to my mind, relieve the responsible authorities from the obligation to place these and all other insured persons upon an equal footing as regards the benefits, as well as regards the contributions of the Acts. In conclusion, I repeat that every effort should be made to secure early establishment of a system whereby insured persons who do not of their own accord or within a limited time join one or other of the present approved societies, shall be guaranteed benefits of no less value than those guaranteed under the Acts to the members of approved societies.

THE OPENING OF THE MAUDSLEY HOSPITAL.

Sir Arthur Griffith-Boscawen, Minister of Health, formally opened the Maudsley Hospital, Denmark-hill, London, S.E., on Jan. 31st. This is the first hospital provided by a public body in England for the treatment of early and recoverable types of mental disorder. Mr. F. R. Anderton, chairman of the London County Council, was in the chair. Mr. D. Cawdron, chairman of the Mental Hospitals Committee of the L.C.C., gave a short account of the establishment and purposes of the hospital, during which he stated that the Council had between 18,000 and 19,000 mental cases to deal with. The hospital, he said, would admit none but voluntary cases; no certified case would be admitted, and no person would be certified therein. It was considered that this decision would be very useful in persuading patients to seek treatment, especially when the latter realised that they could discharge themselves at 24 hours' notice. It was recognised that certain forms of incipient mental disease would not be represented in the hospital, but it was hoped that legislation would shortly make it possible to deal with those types of disorder without certification. Much would be hoped for from the institution, both in the way of benefit to patients and for the advancement of medical science; its success would be the finest testimonial to the great man to whom it owed its being.

Sir Arthur Griffith-Boscawen emphasised the importance of the occasion, in that it marked the inauguration of a new era in the treatment of mental disease. The new departure would, he hoped, save a great deal of suffering in the future. The community generally, and the London County Council in particular, were greatly indebted to the generosity and foresight of the late Dr. Henry Maudsley. Dr. Maudsley's three main interests, to which he devoted much of his life's work, and for which he made most generous provision, were, first, an attempt to deal at an early stage with certain cases of mental disorder, thereby rendering them curable; second, a keen desire to establish exact research into the causes of mental disorder; and, third, a great anxiety to see the proper clinical instruction of students carried on. It had long been recognised that much could be done by early treatment on a voluntary basis, and while grave difficulties surrounded the subject it was most desirable that attempts should be made on proper lines to deal with that great problem. Here they had the chance. He hoped that in the near future Parliament would find time to deal with the whole question of the early treatment of recoverable mental cases, so that similar experiments might be carried out by other local authorities. When Minister of Agriculture he had always urged that progress must depend on research. A great deal of exact research into mental disorder had already been carried out, and here was an institution in which those more or less sporadic inquiries could be concentrated and focused. Medical students had a great deal to learn, but there was no reason why they should neglect mental disorder, and if the work were carried on in close coöperation with the great teaching hospitals and the University of London he felt sure that knowledge would be gained and the opportunity provided for preventing endless suffering in the future. He was glad that special attention had been paid to the selection of the nursing staff. Many unjust aspersions had been cast of late on the nursing staffs of mental hospitals; he was glad that at that institution the nurses selected had had a general hospital training, which was by far the best training for their special work. The committee appointed by his predecessor at the Ministry of Health to inquire into the administration of mental hospitals in this country had recently issued a report generally disabusing the public mind and repelling criticisms, but pointing out certain directions in which progress might be made. Among those directions were the provision of early treatment, concentration of research, higher qualification of the medical staff, a higher proportion of hospital-qualified nurses, and increased opportunities for consultation. Those were the very objects which this hospital had in view, and they were anticipating what Parliament might do in the directions recommended by the committee. He then expressed his great pleasure in formally declaring the hospital to be open.

A vote of thanks to the Minister of Health was proposed by Mr. W. Sidney, vice-chairman of the Hospital Sub-Committee, and seconded by Captain C. D. Kingston, L.C.C. Replying, Sir Arthur Griffith-Boscawen wished success to the institution, making special mention of the names of Sir Frederick Mott, director of the pathological laboratory, and of Dr. E. Mapother, medical superintendent of the hospital. The Minister and members of the Council then made a tour of the hospital.

BURDETT'S HOSPITALS AND CHARITIES, 1922–23.

THE thirty-third issue of this well-known year-book of philanthropy and hospital annual (London: Scientific Press, Ltd. Pp. 875. 17*s.* 6*d.*) contains the usual concise information regarding hospitals and all other forms of medical, nursing, and convalescent establishments in this country, throughout the Empire, and in the U.S.A. The military and naval section has been enlarged, the new names of Poor-law infirmaries are given, and a list of the local committees set up by the Voluntary Hospital Commission appears for the first time in the pages of the year-book. The statistical information has been brought forward a year, so that the year of statistics given in chapters and tables is now identical with that—i.e., 1921—in the directory section. The tables of income and expenditure of convalescent homes, omitted last year pending a return to more normal conditions in connexion with these institutions, has now been reinstated.

A DIRECTORY OF BRITISH CHEMICAL PRODUCTS.

WE have received from the Association of British Chemical Manufacturers, Incorporated, a copy of the new edition of the official directory of the Association for 1923. The directory contains the names of some 150 chemical manufacturers, with a classified list of their products. A section is devoted to proprietary and trade names. The list of products, which is given in more detail than formerly, is reproduced in French, German, Italian, Spanish, and Portuguese for the convenience of overseas buyers. British Commercial Attachés, Consular officers, and Trade Commissioners, and the various Government purchasing departments should find it a valuable work of reference. The Association is prepared to advise on matters relating to the chemical trade, and welcomes inquiries with regard to any particular product. The price of the directory is 10*s.* 6*d.*; copies may be obtained from the offices of the Association, 166, Piccadilly, London, W. 1.

A USEFUL MAP OF LONDON.

EVERYONE who travels by the London Electric Railways has no doubt found cause for amusement and admiration in Mr. MacDonald Gill's poster, depicting the central area traversed by their lines, and executed somewhat in the manner of the old cartographers who filled the less-known portions of their maps with drawings of savages and dragons, interspersed with such legends as "Here is gold." The map is one of which the metropolitan health authorities should take note, for the cartographic art might be utilised far more than it is in the interests of hygiene. A map of London's hospital and first-aid arrangements on Mr. Gill's lines would meet a real need; lessons on local overcrowding and undue infant mortality could be drawn pictorially, and form a useful item of child welfare propaganda. Directions in which healthy expansion countrywards can still take place might be indicated. The scope for the hygienic reformer seems, in fact, almost limitless. The map is plotted on a scale of six inches to the mile; copies may be obtained (price 5*s.*) from the traffic advertising agent, Electric Railway House, Broadway, Westminster, S.W. 1.

SELECTIVE ACTION OF COAL-TAR DYES ON MICRO-ORGANISMS.

AT the Royal Society of Arts on Jan. 31st, Sir Humphry Rolleston, P.R.C.P., being in the chair, the Mann Lecture was delivered by Mr. T. H. Fairbrother, M.Sc., and Dr. Arnold Renshaw, on the Relation between Chemical Constitution and Antiseptic Action in the Coal-Tar Dyes. After dealing fully with the elemental structure of eight different groups of dyestuffs, the authors asked themselves the question: "Is there any selective action possible in regard to the action of dyes upon the minute forms of life, bacterial and protozoal?"

The Facts of Selection.

The answer to this question, they say, is that considering the whole range of dyes, some dyes possess destructive action upon bacteria and upon protozoa, while others in dilutions of 1/200, 1/2000, or 1/20,000 do not, so that speaking generally there are some dyes which exert a more selective action than others. When we consider the dyes possessing this destructive action they fall into the following three groups:—

1. Those which act upon both bacteria and protozoa.

2. Those which act upon some bacteria more than upon others.

3. Those which act in great dilution upon protozoa and in much less dilution upon bacteria.

Thus auramine and crystal violet act upon both bacteria and upon protozoa, and the oxazine dyes, such as Nile blue, Meldola's blue, act much more intensely upon protozoa than upon bacteria. Again, there are other dyes which act more powerfully upon the Gram-positive organisms like staphylococci, *B. diphtheriæ*, and even upon anthrax spores than upon the Gram-negative organisms, such as *B. coli* and *B. typhosus*. Even amongst the Gram-negative group—*B. coli*, *B. lactis*, *B. paratyphosus* A and B, *B. enteritidis* (Gaertner), *B. dysenteriæ* (Shiga), and *B. dysenteriæ* (Flexner)—there is a certain amount of gradation. Thus we have often noticed that Shiga and Flexner are killed more easily than *B. coli* and *B. lactis*, whereas *B. typhosus* occupies an intermediate position. For this reason *B. typhosus* cannot be regarded as a suitable organism for the routine testing of disinfectants. A curious fact emerges in regard to *B. phlœi*—the Timothy grass bacillus, an acid-fast bacillus, resembling in some respects the tubercle bacillus. Presumably like the tubercle bacillus it has a lipoid envelope and so it ought to resist fairly well the action of many of the dyes, yet in our results it was often killed.

The Reasons for Selection.

Are there any reasons, the authors ask, to account for this apparent difference or selective action of dyes upon bacteria and upon protozoa. Some years ago one of us found that a culture of a unicellular plant—the protococcus—could be purified and separated from associated bacteria by immersing the mixed culture in a certain dye solution over a period of days, after which on subculturing into a suitable nutrient fluid a pure culture of the protococcus resulted. Previously all other methods had failed to yield a pure culture of the protococcus. In this experiment the protococcus had resisted the action of the dye which was present in sufficient strength to kill the bacteria. Here the stout cellulose wall of the protococcus had prevented the penetration of the dye to the more vital part of the cell, which still showed unchanged chlorophyll, albeit the cell had entered into a spore stage during the time of immersion in the dye.

Resistance to penetration of the dye is therefore a factor which sometimes helps to explain poor antiseptic action, and it may explain some of those cases in which naked protozoa are killed more readily than bacteria possessing a cell wall. It is not, however, the only factor, for in some cases protozoa may be immersed in a dye and actual vital staining of the cell may occur without death resulting, as in the case of methylene-blue. It is probable, therefore, that the dye has some action either upon the medium in which the bacteria or protozoa are present; or, and more likely, that the dye has a chemical or physical action, or both, upon the organism. In view of the staining which occurs, most often of the nucleus of a protozoon, and sometimes of the protoplasm, it is probable than an actual chemical action takes place leading to a destruction or alteration of the chemical components of the living cell.

Selection not Confined to Dyes.

One fact, however, emerges fairly clearly, and that is that selective action in the dyes is not confined so much to individuals as to broad classes of similar infective agents, and that among these classes selective action of a more restricted type is possible within narrow limits. This fact is not confined to dyes. In the case of salvarsan the drug may act not only upon the *Spirochæta pallida* of syphilis, but upon other spirochætes and even upon spirilla, as shown by its surprising effect upon Vincent's angina. A similar fact apparently holds good in regard to Bayer 205 since this can act not only upon the trypanosome of sleeping sickness, *T. gambiense*, but upon *T. equiperdum* (rats), *T. brucei*, *T. equinum*, and *T. rhodesiense*.

Test Objects.

In our earlier work we used paramœcia largely for purposes of convenience, and ease of observation, and to enable us to run quickly through the list of dyes with the object of detecting those having any protozoal action at all. Having done this we ascertained the effect upon other protozoa—e.g., amœba, and upon trypanosomes. We tried the effect of two of our most active dyes, auramine and Nile blue, separately and in varying dilutions, upon trypanosomes freshly obtained by bleeding a mouse infected with *T. venezuelense*, and found that within 15 minutes a dilution of 1/20,000 of auramine, or 1/20,000 of Nile blue A was sufficient to cause death to all the trypanosomes in the film; whereas control films kept under the same conditions showed great activity at the expiration of even 30 minutes. These results coincided with the dilutions and times in our paramœcium work. Somewhat similar results had formerly been obtained with another flagellate, euglena. Accordingly, we believe that the results obtained with paramœcia can be translated into terms of trypanosomes, and we have no doubt but that dyes which will kill the former will kill the latter in the same dilutions and within the same time. A recognition of this fact should expedite very considerably future research on trypanosomiasis.

Results.

As it is, we have been led by means of our work on paramœcia to the discovery of a dye which we know will kill trypanosomes within 15 minutes in a dilution of 1/20,000. The comparison of this dye with the results quoted by Wenyon in the case of Bayer 205 is proceeding. The comparison between paramœcia and higher forms such as the filariæ is not quite so close, but even here we were able to obtain some resemblance. We have examined the action of the dye on the minute worms or filariæ present in a man suffering from this infection, and we found that auramine again killed the filariæ in five minutes in a dilution of 1/4000 and in 20 minutes in a dilution of 1/8000 when mixed with the patient's blood.

Thus the oxazine group of dyes shows selective action between bacteria and protozoa and to a lesser extent amongst bacteria themselves, killing off paramœcia in high dilution, Gram-positive organisms in lower dilution, and, in dilutions used, not killing off Gram-negative bacteria at all.

"ROUND THE FOUNTAIN."

EVERY teaching hospital has its particular quips and quirks which serve to relieve the strain and monotony of the medical student's daily round. While most of these may have no permanent value, there are literary gems which should not be lost. Mr. B. T. Lang was responsible for the first collection of verses and sketches appearing from time to time in the *St. Bartholomew's Hospital Journal* or forming part of various private collections. This was printed in 1909 under the title of "Round the Fountain," the editor then acknowledging his indebtedness to F. A. Bainbridge, W. M. Borcherds, W. Langdon Brown, R. C. Elmslie, A. H. Hogarth, T. J. Horder, N. G. Horner, H. B. Meakin, J. A. Nixon, K. Pretty, R. B. Price, H. Pritchard, and E. Talbot, his predecessors in the editorial chair. An undue proportion of these are no longer with us, and the remainder have attained distinction in various walks of medicine. This first edition was exhausted within six months, the considerable profits being handed to the Nurses' Home Rebuilding Fund. A new and enlarged edition appeared in 1912, and Mr. H. L. Sackett has just brought out a third edition containing 40 additional pages. Much sound pathology can be read between the lines of the "Disrespectful Ditties" regarding "Dr. Richard Bright of Guy's," "Poor Pa Parkinson, rolling cigarettes," and others. A note on Speeding-up the Out-patient Department can hardly fail to cheer, as also a Suggestion How to Brighten the Clinical Note. The book costs 2*s.* 6*d.*, postage 2½*d.* extra, and is to be obtained from the Journal Office at St. Bartholomew's Hospital, London, E.C. 1.

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